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Reading Comprehension Tests: Multiple Guess?

This study was designed to determine whether certain commercial 10-item multiple-choice reading comprehension tests were vulnerable to guessing. Forty university students were given tests at an "Easy" level, and 40 at a "Difficult" level, without having read the material on which the tests were based. Mean scores were 5.78 for two Easy tests and 5.23 for two Difficult ones, compared with predicted chance scores of 2.5 and 2.0 respectively. Some individual items were guessed correctly by all subjects, and others were guessed incorrectly by almost all. It was concluded that more valid comprehension tests could be developed if items were tested for guessability.

Students commonly refer to multiple-choice tests as "multiple-guess," and there is some evidence that in reference to so-called "reading comprehension" tests, the put-down may be justified. Carver (1972) has criticized speed-reading courses as exercises in skimming rather than reading, and one of his main criticisms is that the tests used to prove that students in these courses maintain high levels of comprehension are invalid. He found that subjects were able to score an average of 57% on a "comprehension" test without having read the material on which it was based. A search of the psychological literature of the years 1967 to 1972 yielded only one reference to the general subject (Samuels, 1968) in addition to Carver's article, and in this case the factor under study was the effect of the wording of items on subjects' guesses, rather than the effect of guessing on test scores.

The present study was designed to find out whether tests used in one of the popular do-it-yourself reading-improvement kits available in many academic counselling settings would be vulnerable to educated guessing.

Method

Subjects of the study were 80 students (50 male, 30 female) or prospective students who were seen individually by the experimenter in the Student Counselling Services at The University of Alberta. Over a period of several weeks each of the experimenter's counsellees (most of them being seen for the first time) who fit certain criteria were asked if they would be willing to spend 10 minutes at the end of the hour as subjects in a research project. Criteria for selection were that the subject be either a student enrolled in the university or a Grade 12 graduate fully qualified for admission, and that he or she be relatively free of serious emotional disturbance as judged by the experimenter. Subjects were thereby limited to clients who presented vocational and/or academic problems.

Each subject performed three tasks: (a) read a selection, (b) wrote a comprehension test on the selection, and (c) wrote a comprehension test on a selection that had not been read.

Reading selections were taken from the Science Research Associates Reading Laboratory Kit, 1959 College Prep Edition. Materials in this kit are color-coded at seven levels of difficulty. For this experiment two selections were chosen at each of two levels: the "Easy" selections were "Olive" numbers 5 and 8 (the second easiest level), and the "Difficult" selections "Purple" numbers 7 and 10 (the most difficult level). The Easy selections will be referred to as A and B, and the Difficult selections as C and D.

Selections A and B contained approximately 250 words each, and C and D approximately 400. Subjects were allowed 90 seconds to read A or B and three minutes to read C or D. It was assumed that under these limits each subject should be able to read the selection at least once. They were informed of the time limits and were instructed to continue studying the material if they finished before time was up. Reading selections and tests were typed on separate sheets so that there could be no re-reading of the material after the test was presented.

At each level of difficulty, subjects were assigned to four treatment groups, consecutively in the order in which they appeared for counselling, according to the following scheme:

1. Read A, test on A, test on B
2. Test on B, read A, test on A
3. Read B, test on B, test on A
4. Test on A, read B, test on B

followed by a similar pattern for C and D.

This pattern was designed to control for position effects and differences in difficulty between the two tests at each level. Half of the subjects in each group would read the selection first, and half would write the "cold" test first. Furthermore, half of the subjects in the "Easy" group would write test A after having read A, and would write test B "cold"; half would write test B after having read B, and would write test A "cold," and so on. There were 10 subjects in each of the eight treatment groups.

Each test was made up of 10 multiple-choice items. Items on tests A and B offered four response choices, and items on tests C and D offered five choices.

Data were analyzed separately for each level of difficulty. Mean test scores for each of the eight treatment groups were calculated. To obtain means for performance after reading (“Read” scores) and performance without reading (“Non-read” scores), scores for the appropriate treatments on tests A and B and on tests C and D were combined.

In addition, the frequencies of all obtained scores were compared with the frequencies expected by chance on the 4-choice and the 5-choice tests.

Individual items were also analyzed. To find out whether there were differences among the items in terms of difficulty or “guessability,” the total numbers of correct responses for each item under “Read” and “Non-read” conditions were determined.

Results

Mean test scores for each of the eight treatment groups and for combinations of the groups are presented in Table 1. By inspection it appears that there were no important differences between tests administered first and second in sequence, and therefore no significant position effects. At the Easy level tests A and B were of approximately equal difficulty for the Readers, but test B seems to have been easier for the Guessers, who made a mean score of 6.85 on test B and 4.70 on test A. At the Difficult level there was no difference in guessability between tests C and D, but C seems to have been a little easier as a comprehension test for the Readers.

TABLE 1
MEAN SCORES ON COMPREHENSION TESTS FOR FOUR READING SELECTIONS

Selection	Read			Non-Read		
	First	Second	Total	First	Second	Total
A	7.60	8.10	7.85	4.80	4.60	4.70
B	8.20	8.10	8.15	7.10	6.60	6.85
A + B	7.90	8.10	8.00	5.95	5.60	5.78
C	7.10	7.50	7.30	5.00	5.40	5.20
D	6.40	6.90	6.65	5.30	5.20	5.25
C + D	6.75	7.20	6.98	5.15	5.30	5.23

When the total scores for the 40 subjects at each level were considered, the most significant finding was that the Guessers performed quite well. At the Easy level their mean score was 5.78, and at the Difficult level 5.23. Since the number of response choices on each item was four at the Easy level and five at the Difficult level, the mean chance scores on the 10-item tests would be 2.5 and 2.0, respectively. Mean scores of the Readers were 8.00 at the Easy level and 6.98 on the Difficult tests.

Obtained frequencies of scores on the “Read” and “Non-read” tests are presented in Table 2.

TABLE 2
EXPECTED AND OBTAINED FREQUENCIES OF SCORES ON READ AND
NON-READ COMPREHENSION TESTS

Selections A & B				Selections C & D		
Score	Expected Frequencies ^a	Obtained Frequencies		Expected Frequencies ^a	Obtained Frequencies	
		Read	Non-Read		Read	Non-Read
0	2.25	0	0	4.29	0	0
1	7.51	0	0	10.74	0	0
2	11.26	0	1	12.08	0	2
3	10.01	1	2	8.06	0	2
4	5.84	0	7	3.52	2	7
5	2.34	2	7	1.06	5	9
6	0.65	4	9	0.22	5	14
7	0.12	8	7	0.03	12	6
8	0.02	6	6	b	13	0
9	b	11	1	b	2	0
10	b	8	0	b	1	0

^a Frequencies expected by chance in 40 cases

^b Negligible

Expected frequencies were determined in a manner similar to the following example: on a 10-item test, three correct answers can be obtained in 120 (10 x 9 x 8 divided by 1 x 2 x 3) different ways; if there are four response choices the remaining seven items can be answered incorrectly in 3⁷ different ways; and the total number of possible combinations of answers is 4¹⁰. Therefore the probability of obtaining three correct answers by chance is 120 x 3⁷ over 4¹⁰, or .2503, and this figure multiplied by 40 gives the expected frequency of 10.01 for 40 subjects.

It is obvious by inspection that chi-square tests applied to the differences between expected and obtained frequencies for both the Read and the Non-read tests would yield values of astronomical magnitude. In only one case in 80 did a Guesser score below the chance level—a score of 2 on test A. Two other Guessers made precisely chance scores of 2, one on each of tests C and D. Whereas the expected frequency of scores of 5 or higher on the two Difficult tests was 1.31 in 40 cases, the obtained frequency of such scores was 29. At the Easy level 30 of the 40 subjects scored 5 or higher, in contrast to an expected frequency of 3.13. It seems safe to conclude that as a group the Guessers scored significantly higher than would be expected by chance.

Obtained frequencies of correct answers on each item of the four tests are given in Table 3. The maximum possible score for each item of course would be 20, since each test was written by 20 subjects. Differences in guessability among the items were quite striking, as shown by the extreme

range of the Non-read scores—from zero to 20. At one extreme were four items that were answered correctly by all of the Guessers—and in each case answered incorrectly by one or more of the Readers. At the opposite extreme were a number of items that seemed to be very difficult to guess correctly but comparatively easy to answer after reading—for example items 2 and 4 on test A, and item 6 on test B.

TABLE 3
FREQUENCIES OF CORRECT ANSWERS ON EACH ITEM OF FOUR
COMPREHENSION TESTS

	Test A		Test B		Test C		Test D	
Item	Read	Non-Read	Read	Non-Read	Read	Non-Read	Read	Non-Read
1	16	20	16	15	18	16	15	16
2	12	0	14	9	18	14	7	9
3	19	10	15	18	16	7	19	20
4	18	3	10	14	13	10	19	11
5	15	12	20	16	11	10	10	6
6	14	5	17	3	18	5	7	7
7	17	10	13	12	14	7	18	16
8	17	8	20	19	17	20	16	5
9	18	20	20	16	17	11	15	13
10	11	6	18	15	4	4	7	2

Discussion

In this study students were able to score from 47% to 68% on commercial “reading comprehension” tests without reading the material on which the tests were based. It is obvious that they were doing more than mere guessing—drawing on past learning, picking up cues from one item to answer another, critically weighing the wording of items, etc.

The most significant finding of the study would seem to be that tests and individual items varied widely in their vulnerability to “guessing.” In the tests used in this study there were four items that were answered correctly by all of the Guessers. Two of these items called for the definition of single words, and the other two were expressed in such terms that any moderately sophisticated university student might be expected to find only one answer reasonable. (It may be noted with some gratification that one of the words that was recognized by all of the student subjects was “democracy.” The other, alas, was “archipelago.”) The fact that some items proved almost invulnerable to guessing suggests that more valid comprehension tests could be developed if items were tested for guessability before being included. Samuels’s (1968) finding that guessers were influenced in their choices by certain word associations seems pertinent to this problem.

Another way of expressing the findings of this study would be to state that the SRA reading kit tests are not very reliable, because they are

highly susceptible to guessing; and of course their low reliability is also due in part to their brevity. The phenomena of brevity, guessability, and low reliability go hand-in-hand-in-hand. As Cronbach (1960) points out in a discussion of reliability, "If a test has only five multiple-choice items, a few people might get all the items correct just by guessing. In a fifty-item test practically no one could do well by guessing. Variations due to guessing tend to cancel out [p. 130]." There is no technical manual accompanying the SRA kit, and hence no information on reliability, and it seems unlikely that the tests (140 in all) have been subjected to reliability studies.

The manual for the reading accelerator that is used with the SRA materials (Simpson, 1958) suggests that the student has increased his paced speed by 15% if "the average of the last two comprehension scores is 70% or better [p. 16]." The assumption seems to be that a score of 70% indicates adequate comprehension. In general practice there seems to be an implication that the test score gives a measure of the quantity of comprehension—that a score of 50%, for example, means that the reader has remembered 50% of the material. It appears more likely that a score of 50% means nothing at all.

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An Abbreviated Version of the 1960 Stanford-Binet, Form L-M

The purpose of this study was to test a short version of the Stanford-Binet, Form L-M using a group covering a wide age and ability level. The prime reason was to attempt to reduce the time factor involved in administration of some of the S-B tests, without sacrificing the reported accuracy. From the results it appears that this short method of S-B administration will reduce the time needed to administer the S-B without adversely affecting the accuracy of the I.Q. score.

Little research is available concerning the Short Form method of administering the Stanford-Binet Form L-M, published in 1960. Investigations with the short versions have been carried out with specialized groups, usually with mentally retarded and occasionally with disadvantaged Negro groups. Employing either the short form according to the manual (Terman and Merrill, 1960) or the procedure designed by Wright (1942), studies have shown correlations from .93 to .99 with the unabbreviated Stanford-Binet.

Although the S-B is a proven individual test of mental ability for school age children, it is used with reluctance in many cases because of the time factor involved. It often occurs that a child will continue to score on one sub-test at various age levels before a ceiling age can be determined; the reverse, when attempting to determine the basal age, is also true. There appears to be some merit, therefore, in investigating the possibility of employing a shorter version of the S-B for routine individual intelligence testing, especially in the schools. The question arises concerning the advisability of investigating this possibility using mentally retarded or specialized groups. A strong thesis could be formed in favor of extending and lengthening the method used in testing these groups and not in shortening it.

In the S-B manual (Terman and Merrill, 1960) the method employed to shorten administration is to use four selected tests at each age level

and to weight these tests more heavily than with normal scoring (p. 61). The suggested time saving is 20 per cent.

Wright's method (1942) of S-B abbreviation is slightly different. She advocates administering all six original items at the levels at which the subject passes, or fails, the four items in the recommended short version. To attain a basal age or ceiling age, all six items at the next, lower or higher, levels, are administered if necessary. Robinson and Robinson report that this method saves relatively little time and the longer form is preferable (1965, p. 413).

The proposition is made here that the recommended short version of the S-B, and Wright's version, both have the fault that they use only a sample of the test items and difficulties can arise from this. In studies reported by Watson (1963) both versions result in lower mean I.Q.'s and occasional wide discrepancies from the fully administered S-B. Wright's version also has a disadvantage in that it appears to save little time.

It is suggested here that the criteria for determining basal and ceiling ages be as follows: basal age is that age level at which all sub-tests are passed but one; ceiling age is that age level at which all sub-tests are failed but one. This method would make use of *all* items at age levels and not a sampling of those items. The rationale for this suggestion is that it is not unusual that a testee passes or fails all but one sub-test at an age level, thus extending the time required for the test.

Method

Five hundred S-B protocols, covering an age range from three years four months to seventy years six months and an I.Q. range from 160 to 45 were investigated. These protocols were from a wide variety of sources and not limited to referral or clinical cases, although some of these were included.

The protocols were re-scored employing the following methods. With the individuals whose chronological age was six years or over, the vocabulary section dictated the age level at which the scoring would begin. With individuals whose ages were under six years the starting point was one level below that of their chronological age. Basal age was determined as the age level at which all sub-tests were passed but one. Ceiling age was determined as that level at which all sub-tests were failed but one.

Tests were re-scored in this manner and any change in mental age and I.Q. was recorded. The number of levels omitted because of the new scoring procedure was recorded for each case.

A test of significance of difference between the mean I.Q. of the fully administered S-B and the mean I.Q. of the short version was used. Pearson product-moment correlation was calculated for the relationship between the fully administered and the employed short method. This analysis was carried out with the total number of tests and again with those tests which showed a difference in I.Q. points because of the shortened version of the S-B.

Results

Table 1 indicates that when the 500 tests were re-scored using the method described, 611 age levels were omitted or saved; 203 tests showed no I.Q. change even with 260 age levels omitted; 126 tests showed an I.Q. difference with 351 age levels omitted; and the short method was not useful with 171 of these tests, the time factor being the same by both methods.

TABLE 1
RESULTS OF RE-SCORING THE 500 TESTS

Description	No. Tests	Levels Omitted
No change in I.Q.	203	260
Differences in I.Q.	126	351
Short version not useful	171	0
Total	500	611

Table 2 indicates the differences between the fully administered tests and the shortened method of scoring.

TABLE 2
DIFFERENCES BETWEEN THE STANDARD AND
SHORTENED SCORING METHODS

Tests	N	Levels Omitted	Mean I.Q.	S.D. I.Q.	C.R.
Standard scoring	500	—	114.192	20.05	.012
Short version	500	611	114.176	20.71	

With the 126 tests which showed a difference in I.Q. score, 351 levels were omitted and there was a 1.27 difference between the means of the two groups. Table 2 shows the comparison between the two groups.

TABLE 3
COMPARISON OF STANDARD SCORING AND SHORTENED METHODS

Tests	N	Levels Omitted	Mean I.Q.	S.D. I.Q.	C.R.
Standard scoring	126	—	113.71	23.28	.603
Short version	126	351	112.44	23.28	

The overall difference in I.Q. points between the 500 fully administered and short version tests amounted to .996 I.Q. points per test with 1.22

age levels saved per test. With the 126 tests showing a difference of I.Q. points, the change was 3.96 I.Q. points per test and 2.84 levels omitted per test.

Over the total number of tests (500), the correlation was .9592 between the fully administered S-B and the short version. A correlation of .9991 was obtained between the 126 tests which had shown a difference in I.Q. points.

Discussion and Conclusions

This short version has the advantage that it does not sample subtests from age levels as recommended by the S-B manual (Terman and Merrill, 1960), and recommended by Wright (1942). According to Robinson and Robinson (1965) the method proposed by Wright saves little time in actual test administration.

The wide variety of age and ability levels was selected because it was felt that an investigation of this type must first be carried out with a group other than a mentally retarded or exceptional group. The reasons for this decision were presented earlier in this paper.

While this short version compares favorably with the full scale administration of the S-B and eliminates a considerable amount of testing time, there are several cautions needed. Any method of data analysis tends to conceal anomalies within the data. Five of the 500 cases showed an I.Q. difference varying from 9 to 12 points. One case differed by 18 I.Q. points. These six cases involved children under the chronological age of 11-3 years and with a superior or above average mental age level. This might be explained as a function of some age levels but this investigation must be replicated in an effort to explain these changes. Notwithstanding, this short version appears to have some merit without the disadvantages of the other two procedures discussed. It must be considered too, that most previous studies using abbreviated versions of the S-B have been done with mentally retarded groups. These groups do not appear to suffer I.Q. changes when a short method is employed. In this study, if cases with I.Q.'s less than one standard deviation below the mean are isolated, there are no I.Q. changes more than three points; two cases lost three I.Q. points, one case gained three points and one gained two points. Fourteen cases remained unchanged.

Before any abbreviated version of the S-B can be safely employed, it must first be fully investigated using age and ability levels encompassing a wide range. The present study suggests a method of abbreviating the time taken in testing using an *ex post facto* analysis. The usefulness of the abbreviation suggested still requires experimental validation.

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Trends in the Patterns of Staff Utilization in the Elementary Schools of Alberta: Implications for Teacher Education

While teacher education institutions must lead as well as follow, accurate information as to the status of the various instructional and organizational practices in the schools is certainly one prerequisite for the planning of both preservice and in-service curricula. In reporting on a survey of team teaching practices in western Canada, MacKay and Ward (1967) conclude, in part: ". . . those who are concerned with educational decision making in Canada must take account of the effect such developments have upon staffing needs, building design, in-service education, and teacher education programs (p. 12)." The purpose of the study reported here was to examine the patterns of staff utilization in the elementary schools of Alberta in 1968 and in 1971 and to draw implications for teacher education.

During the last ten years, team teaching and other patterns of staff utilization resulting in a move away from the self-contained classroom have received increasing attention both in the literature and in practice. In western Canada, for example, MacKay and Ward (1967) reported that, "the practice of team teaching is fairly extensive," while one year later Ratsoy (1968) concluded: "Team teaching is growing rapidly in the West." (p. 49)

Definitions of the four patterns of staff utilization examined in the present study appear below. The definitions appear defensible but, obviously, not all team teaching, as an example, is the same. Anderson (1965) has suggested that "dozens of different patterns of school and staff organization," (p. 22) may be found under the general heading of cooperative teaching. Shaplin, in Shaplin and Olds (1964), in writing about

team teaching projects, remarks: “. . . one is impressed by their great diversity in methods of organization and aims.” (p. 5)

The location of an elementary school, whether in a rural or an urban setting, would seem to justify certain expectations in terms of staff utilization. In a survey of practices in music education in Alberta, Coultas (1965) noted important differences in urban and rural systems.

In cities and towns approximately one-tenth of classroom teachers were responsible for teaching music as compared with approximately two-thirds of teachers in divisions and counties. (p. 96)

Blench's survey of the teaching of science in Alberta, reported in 1967 that many urban elementary schools were using a type of departmentalization or semi-departmentalization to teach science while in rural schools science was more likely to be taught by the classroom teacher (p. 133). Also of interest to the present study is Blench's report of the contrast between primary and intermediate grades in terms of teacher specialization (p. 133).

Many studies, including the present one, report dramatic changes in patterns of staff utilization as well as marked increases in the relative amount of team teaching. The results of these studies should probably be considered in the context of recommended procedures for introducing team teaching. Polos (1965), as a typical example, strongly supports the need for in-service training to precede and accompany the move toward team teaching (p. 107).

Procedures

The four patterns of staff utilization investigated were defined as follows:

1. *Team or Cooperative Teaching*: One or more teams in which two or more teachers per team jointly plan, present, and evaluate in-school experiences for pupils from grade one to grade six inclusive.

2. *Departmentalized Teaching*: No team or cooperative teaching but with 50 per cent or more of the teachers' time, on the average, spent in teaching classes other than their own.

3. *Semi-Departmentalized Teaching*: No team or cooperative teaching, some exchange of subjects but with 50 percent or more of the teacher's time, on the average, spent in teaching her own class.

4. *Self-Contained Classrooms*: No team or cooperative teaching, with teachers teaching all subjects in their own classrooms.

In 1968 all superintendents in the province of Alberta and eighty-three elementary school principals and their staffs were asked to fill out a questionnaire to determine the patterns of staff utilization being used in the elementary schools of the province and the preferences of the various personnel for these patterns. The principals and school staffs were selected as a random sample, stratified to represent the rural-urban distribution of schools, schools of different sizes, and the four different staff utilization patterns as indicated by the superintendent. All data to follow were obtained from the superintendents except for the preferences of

the principals and teachers. All superintendents returned the questionnaires and approximately 86 per cent of the school staffs.

In 1971 all superintendents were again asked to report on the patterns of staff utilization in the elementary schools in their districts. 93 per cent of the superintendents replied—all but those from four relatively small districts. All data from both sets of questionnaires were summarized and certain comparisons made using the chi square statistic.

A number of limitations should temper the conclusions drawn as a result of the findings below.

1. In 1968 an urban district could rightly be defined as one having a locally appointed superintendent. By 1971 this test for an urban district was no longer completely appropriate. All districts which were designated urban in 1968 were placed in the same category in 1971, although some moves toward or away from urbanity may have taken place.

2. As has been pointed out above, the four categories of staff utilization investigated are somewhat arbitrary when we recall the tremendous diversity of staff utilization practice.

3. The preferences for staff utilization patterns, solicited in 1968 from superintendents, principals and teachers, are recognized as weak indications of the direction which practice might take. The availability of adequate staff and facilities are only two factors which might cancel out the effect of attitude.

Findings

Staff Utilization in 1968.

The great majority of elementary teachers were teaching all or most subjects to a single group of children in 1968. Comparatively little special-

TABLE 1
PATTERNS OF STAFF UTILIZATION IN THE
ELEMENTARY SCHOOLS OF ALBERTA, 1968

Rural - Urban	Team		Semi-	Self-
	Teaching	Departmentalized	Departmentalized	Contained
Rural:				
I	*.2 (1)	.7 (3)	24.7 (112)	74.4 (338)
II	.8 (4)	7.1 (34)	40.5 (193)	51.5 (245)
Urban:				
I	3.4 (13)	.5 (2)	22.5 (86)	73.6 (282)
II	8.8 (33)	7.5 (28)	65.7 (245)	18.0 (67)
Total:				
I	1.7 (14)	.6 (5)	23.6 (198)	74.1 (620)
II	4.4 (37)	7.3 (62)	51.6 (438)	36.7 (312)
Grand Total:	3.0 (51)	4.0 (67)	37.7 (636)	55.3 (932)

* .2 percent (1 school) of all rural elementary schools having one or more primary classrooms uses team teaching. All figures in Table 1 conform to this format.

ization, either in the form of departmentalization or team teaching, was in evidence. There were, however, some interesting differences between primary and intermediate patterns of staff utilization: there was more team teaching, departmentalization and semi-departmentalization in the intermediate grades of Alberta, that is, relatively more specialization, and, relatively, about twice as many self-contained organizations in primary. Marked differences were found between the relative numbers of rural and urban patterns, with more team teaching in urban schools, more semi-departmentalized organizations in urban intermediate, and almost three times as many self-contained intermediate schools in rural (Table 1).

The preferences of teachers, principals, and superintendents in 1968 for the various patterns of staff utilization in the elementary schools of Alberta provided a dramatic contrast with the actual incidence reported above. While other factors, such as the availability of suitable staff and facilities, must exert powerful influences on the staff utilization patterns, it would seem likely that the preferences of key educators would be the most important factor determining educational practice.

The superintendents in Alberta in 1968 expressed a preference for team teaching in urban schools and for semi-departmentalized patterns in rural schools. Across the province, team teaching was preferred

TABLE 2
SUPERINTENDENTS' PRINCIPALS' AND TEACHERS' PREFERENCES
FOR PATTERNS OF STAFF UTILIZATION IN THE ELEMENTARY
SCHOOLS OF ALBERTA EXPRESSED IN PERCENTAGE OF FIRST
CHOICES, 1968

Position		Rural - Urban	Team Teaching	Depart- mentalized	Semi- Depart- mentalized	Self- Contained
n.						
Superin- tendent:	Rural:	I (56)	*30.4	0	60.7	8.9
		II (57)	43.9	31.6	21.1	3.5
	Urban:	I (21)	33.3	0	47.6	19.0
		II (21)	52.4	33.3	14.2	0
	Total:	I (77)	31.2	0	57.1	11.7
		II (78)	46.2	32.1	19.2	2.6
Principal:	Rural	(29)	24.1	34.5	34.5	6.9
	Urban	(44)	56.8	9.1	34.1	0
	Total	(73)	43.8	19.2	34.2	2.7
Teacher:	Rural	(336)	17.0	19.3	41.1	22.6
	Urban	(512)	28.1	10.5	42.2	17.2
	Total	(848)	23.7	15.2	41.7	19.3

* 30.4 percent of rural superintendents ranked team teaching first as their preferred method of staff utilization for primary grades. All figures in Table 2 conform to this format.

for intermediate grades and semi-departmentalization for primary. Both rural and urban teachers preferred semi-departmental organizations. Team teaching received less support, and the self-contained classroom more support, from teachers than from either principals or superintendents (Table 2).

Staff Utilization in 1971.

As in 1968, the great majority of teachers taught all or most subjects to a single group of children: however even a casual comparison between the data for the two years would suggest a decided trend towards the sharing of at least some subjects. There was, then, much more specialization than in 1968.

The sharp contrasts between primary and intermediate patterns of staff utilization, noted in 1968, were still in evidence in 1971: there was more team teaching, departmentalization, and semi-departmentalization in intermediate grades and more self-contained organizations in primary. However, specialization had increased in primary at a faster rate during the three year period.

Rural-urban differences were still notable in 1971. Even greater differences were found in the incidence of team teaching and of self-contained classrooms in rural and urban schools (Table 3).

TABLE 3
PATTERNS OF STAFF UTILIZATION IN THE ELEMENTARY
SCHOOLS OF ALBERTA, 1971

Rural - Urban		Team Teaching	Departmentalized	Semi- Departmentalized	Self- Contained
Rural:					
	I	*3.0 (14)	1.7 (8)	39.7 (186)	55.6 (260)
	II	4.0 (18)	12.3 (55)	53.3 (239)	30.4 (136)
Urban:					
	I	13.2 (49)	2.2 (8)	40.8 (151)	43.8 (162)
	II	18.0 (65)	8.0 (29)	65.7 (238)	8.3 (30)
Total:					
	I	7.5 (63)	1.9 (16)	40.2 (337)	50.4 (422)
	II	10.2 (83)	10.4 (84)	58.9 (477)	20.5 (166)
Grand Total:		8.9 (146)	6.1 (100)	49.4 (814)	35.7 (588)

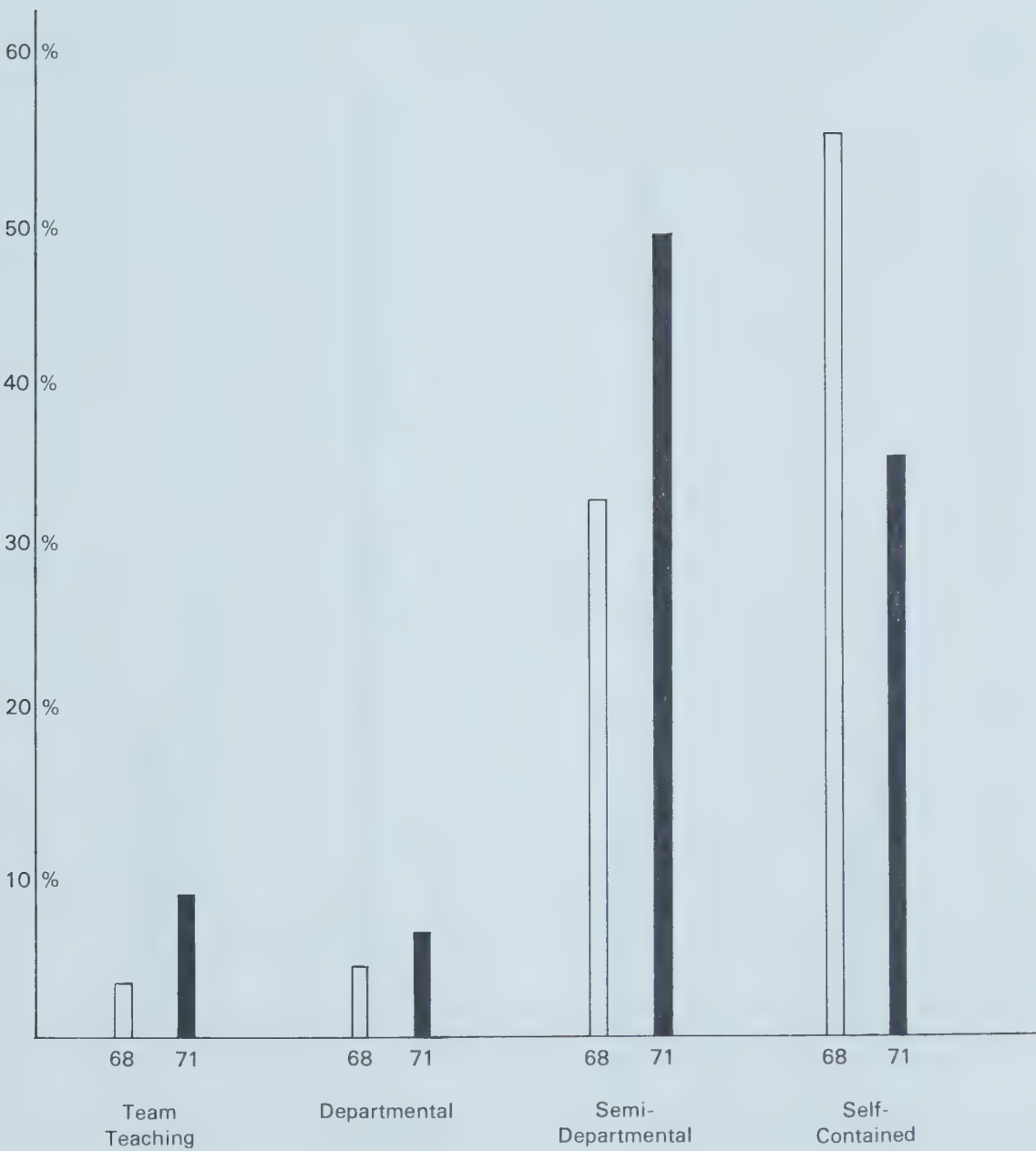
* 3.0 percent (14 schools) of all rural elementary schools having primary classrooms use team teaching. All figures in Table 3 conform to this format.

1968 vs. 1971

A significant difference was found when the 1968 results were compared with those of 1971 ($\chi^2 = 151.62$, $p > .001$). The most dramatic change was in the decrease in the incidence of the self-contained classroom. This is attributable to an increase in specialization in the form

of semi-departmentalization and, to a lesser degree, in team teaching and departmentalization (Figure 1).

FIGURE 1
1968 Compared with 1971 Patterns
of Staff Utilization

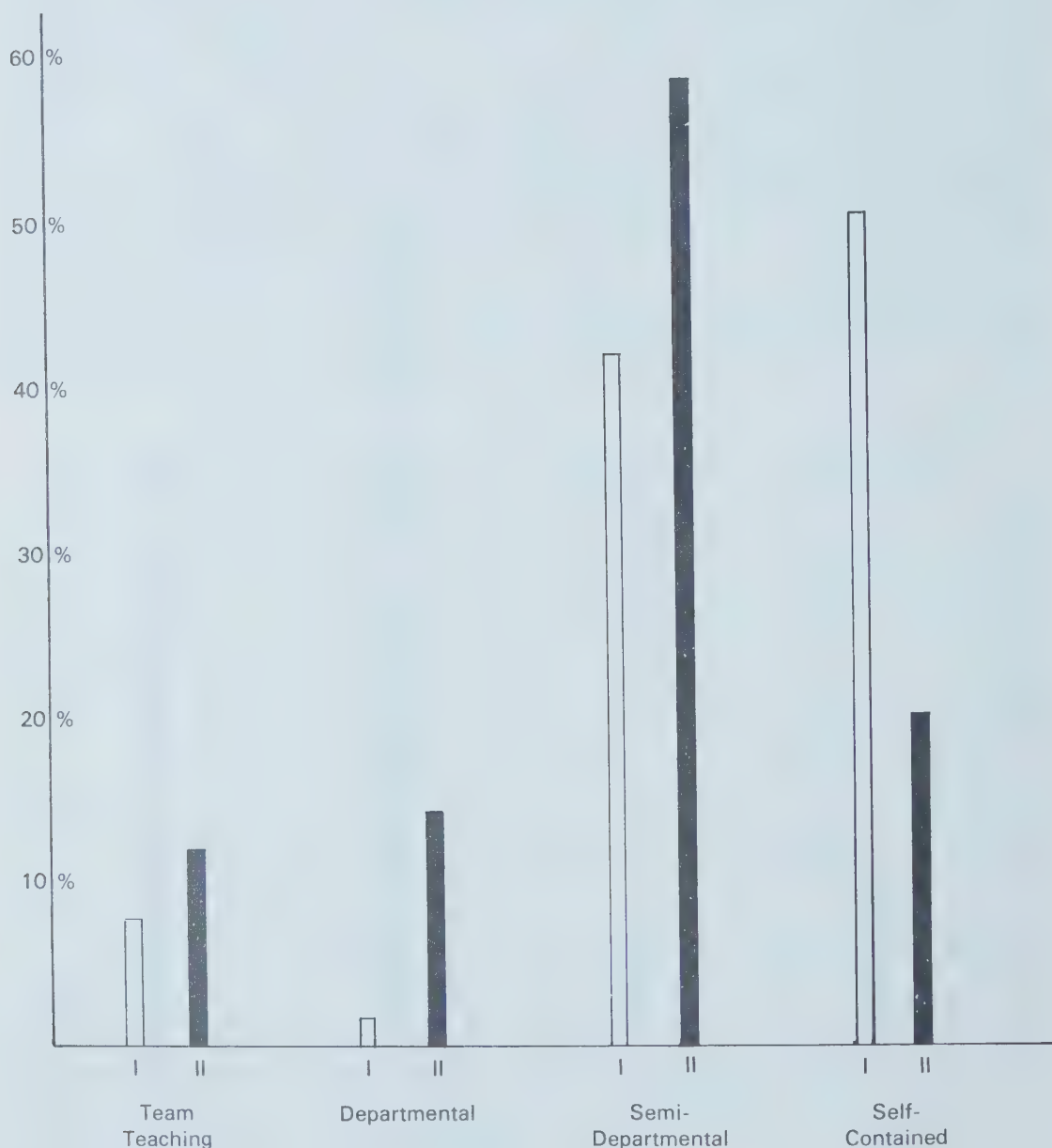


1971 Results: Primary vs. Intermediate

A significant difference was found between primary and intermediate patterns of staff utilization in 1971. ($\chi^2 = 184.09$, $p < .001$). About two and one-half times as many self-contained organizations were found in

primary compared with intermediate. More team teaching, semi-departmental and departmental organizations were found in intermediate grades (Figure 2).

FIGURE 2
Primary Compared with
Intermediate Patterns of
Staff Utilization, 1971

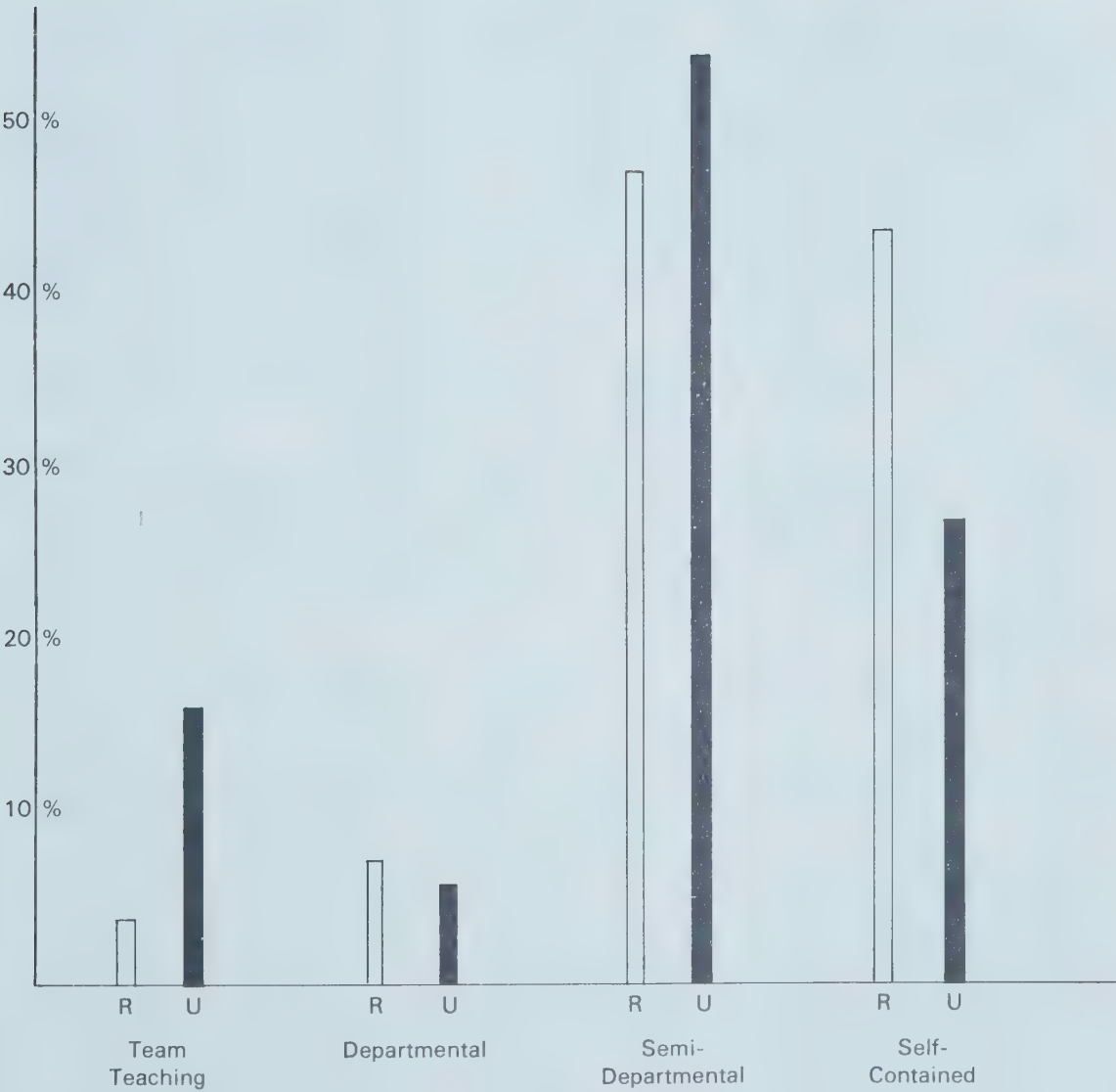


1971 Results: Rural vs. Urban

Patterns of staff utilization in elementary schools in 1971 were found to be significantly different depending upon whether the schools were found in rural or urban Alberta ($\chi^2 = 105.95$, $p < .001$). The greatest

differences existed in self-contained classrooms and in team teaching: many more self-contained classrooms were found in rural Alberta and more team teaching in urban Alberta (Figure 3).

FIGURE 3
Rural Compared with Urban Patterns
of Staff Utilization



1971 Results: Patterns by Size of School

The patterns of staff utilization were found to be significantly related to the size of the school. The small schools whether rural or urban, primary or intermediate, tended to have a higher than average incidence

of self-contained classrooms. The larger schools tended to use more staff specialization including more team teaching.

1971 Results: Patterns by Size of District

Except for rural primary, the incidence of patterns of staff utilization was found to be significantly related to the size of the school district as measured by the number of instructional units in the district. (The primary division of a school, for example, might be described as an instructional unit for purposes of the present survey). The largest districts tended to have a higher than expected frequency of team teaching.

Conclusions and Implications

1. The findings of this study indicate a major change in the elementary schools of Alberta over a relatively short period of time. The implications for teacher education are many. For example, about one out of every ten of the elementary schools in Alberta was using team teaching in 1971. The curriculum of teacher education institutions, with the current emphasis on the self-contained classroom, would, consequently, seem to be in need of change. Optional pre-service courses, providing for the development of team teaching skills, might be offered. In addition, since pre-service education is over for many teachers who are now a part of new organizational plans, the responsibilities of faculties of education must be extended to match the professional life of the teacher—from admission to teacher education until retirement.

2. The great speed of the change reported here is disturbing. Ideally, change is a rather deliberate process, based on the evaluation of existing practices, careful planning and provision for self study and inservice programs. The process described is time consuming and does not permit the amount of pendulum-swinging which might be one interpretation of the present data.

3. Substantial differences in patterns of staff utilization between certain groups of schools were noted. Rural and urban schools, primary and intermediate grades, small elementary and large elementary schools, and small school districts and large school districts were all significantly different in terms of staff utilization patterns. The reasons for the differences are only partly known but all differences noted would probably suggest differences in the amount or in the nature of the pre-service and in-service education to be made available. For example, the rural-urban differences might suggest that change is easier in urban centres where more new schools are built each year. Without presuming to place value on the various patterns of staff utilization, the impetus for change has been felt to a much lesser degree in rural areas, at least in that at least in the area studied in the present study. If this apparent slowness of change is characteristic of rural areas, perhaps the pre-service and/or in-service education for rural areas needs to be different from that provided for urban areas.

4. The actual changes in patterns of staff utilization are interesting, but the reasons for these changes are even more important. For example, do subject-centred individual differences suggest that greater teacher

specialization is perhaps taking place at the expense of the child as a person? Research to identify reasons for change is badly needed: this study suggests the need for major research studies beyond the scope of individuals.

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Political Climates, Political Knowledge and Political Preferences of University Students

This article examines the impact of a number of socio-political variables and the political environment — the national political opinion climate — on the party choice of university students using data from 1,006 questionnaires completed by first year University of New Brunswick students.

Political attitudes and political socialization of the student, have received increasing attention in recent years. The lowering of the voting age to 18 has given young voters an opportunity to influence the outcome of any national election. The continuity of political party choice across generations is well documented. Yet, the choice of a political party, as Levin (1961) points out, is influenced by "the political climate of opinion in various subsystems of which the adolescent is a member and contributes to his political socialization and his choice of a political party" (Levin, 1961, p. 596).

This article reports research which considers the influence of some background variables on the political party preferences of university students in the province of New Brunswick.

Levin, employing data collected from students in ten northern Illinois high schools, found the best predictor of the students' party choice to be the party choice of their parents (Levin, 1961, p. 596). Johnson (1972), in a similar work in six rural Kentucky counties, reports that "the overwhelming factor influencing youth's political party preference is the preference of parents" (Johnson, 1972, p. 51). However, there are other factors, besides parental influence, which affect the choice of political party. On the one hand, there are social structural variables such as sex, socioeconomic status (SES) and religion which influence the voting patterns. For instance, Blake reports that in Canada "Roman Catholics show disproportionate support for the Liberals" (Blake, 1972, p. 71). Moreover, on a regional basis, he demonstrates that there is less Liberal support, amongst the whitecollar group in the Maritimes and more in British Columbia (Blake, 1972, p. 71). On the other hand, there are

psychological feelings and knowledge about political matters which can also influence the choice of a political party. Political leaders might be wondering as to how an individual's self-definition as a liberal or a conservative affects his voting patterns. After all, a student who chooses to define himself as a liberal will not be likely to contradict himself and vote for the Progressive Conservative party or vice-versa. Another question is: How do the alienated and relatively unalienated youth differ in their voting patterns? What is the impact of a person's level of political knowledge on his political choice?

The aim of this research is to examine the effects of the above-mentioned variables on the voting patterns of students, but, also to test the contention that almost nine years of Liberal government has produced some variation in favor of the Liberals.

Method

Data were collected from first year students in the University of New Brunswick. Questionnaires were administered in the early fall of 1971, after nine years of a federal Liberal government. Consequently, these students who were entering the adult political world, had spent the years from ten to eighteen in a national political opinion climate (operationally defined by the party in power at the national level) that was Liberal.

Respondents' political preferences were ascertained by asking them to name the party they would vote for in an election and also by their political self-definition. Father's political preferences were also reported by respondents.

Measurement of alienation, political knowledge, and socioeconomic status (SES) was accomplished by appropriate scales which are reported elsewhere by the author (Ghaem-Maghami, 1972). Briefly, following Seeman (1966), alienation is measured by a ten item powerlessness scale: scores were dichotomized at the mean. Those who scored above the mean were classified as alienated. The political knowledge scale was operationalized by a twenty-five item information test which

TABLE 1
POLITICAL PARTY CHOICE BY SEX AMONG UNIVERSITY STUDENTS
(in percentages)

Party Choice	Male (N=650)	Female (N=356)	Total (N=1006)
Progressive Conservative	22	17	20
Liberal	38	48	42
New Democratic Party	16	10	14
Undecided	23	25	24
Total Per Cent	100	100	100

$\chi^2 = 12.71$; 3 df, $p < .01$.
Cramer's V = .11.

required the student to identify political authorities and organizations in the Canadian and international scene as in the following examples:

- 1. Who is the Finance Minister of Canada?
- 2. What do the initials NATO stand for?

Students unable to identify more than five items were categorized as having low political knowledge. SES was measured by a composite index which combines education, income, and occupation of parents of the respondents.

Findings

The data show that the Liberal party is much more favored among these students than either the Progressive Conservatives or the New Democratic Party (N.D.P.). As is shown in Table 1, 42 per cent of students indicated that they would vote for the Liberals in an election, as compared to 20 per cent for the Conservatives and 14 per cent for the N.D.P. However, the Liberal party is favored more than three to one by female students, against the Conservatives (48% vs. 17%), and almost five to one against the N.D.P. (48% vs. 10%). It should be noted, however, that twenty-five per cent of students are undecided about their political party choice in a future election.

Although it has been found in previous studies that Roman Catholics show disproportionate support for the Liberals, Blake (1972, p. 70) reports a high level of Conservative support amongst Catholics in the Prairie Provinces and in the Maritimes. To examine this trend in our data we controlled for religion. Table 2 demonstrates that, at least among

TABLE 2
POLITICAL PARTY CHOICE AND RELIGION OF THE STUDENTS
(in percentages)

Party Choice	Catholics and Others (N=342)	Protestant (N=664)	Total (N=1006)
Progressive Conservative	16	22	21
Liberal	44	40	42
New Democratic Party	16	13	14
Undecided	24	25	24
Total Per Cent	100	100	100

$\chi^2 = 6.66; 3 \text{ df, } p < .10.$

students, this trend has been reversed in favor of the Liberals. Only 16 per cent of Catholics say they will vote Conservative as compared with 44 per cent who would vote for the Liberals. Moreover, Conservatives can count only on 22 per cent of the Protestant vote among these students—almost half that of the Liberals (40%). Blake reports that “the white-collar group is also the only class group which appears to differ by

region, with less Liberal support in the Maritimes and more in British Columbia" (Blake, 1972, p. 71). To see if the national political climate has affected this trend we controlled for various measures of socioeconomic status. Table 3 presents the party choice and father's occupation

TABLE 3
POLITICAL PARTY CHOICE OF STUDENTS ACCORDING TO THEIR
FATHERS' OCCUPATIONS
(in percentages)

Party Choice	White-collar (N=517)	Blue-collar (N=489)	Total (N=1006)
Progressive Conservative	17	24	20
Liberal	45	38	42
New Democratic Party	14	14	14
Undecided	24	24	24
Total Per Cent	100	100	100

$\chi^2 = 8.63$; 3df, $p < .05$.

Cramer's $V = .10$.

among students. However, it should be noted that the cross-tabulations with other dichotomized measures of social class such as the SES scale, father's income and father's education produced almost an identical result. These results show that there exists a slight tendency (7%) for the high SES group to vote for the Liberal party and for the low SES to vote for the Conservative party (also 7%). It is shown in Table 3 that 38 per cent of students with blue-collar fathers as compared to 45 per cent of those of white-collar origin would vote for the Liberals. On the contrary, 24 per cent of those whose fathers had a blue-collar job would vote Conservative, as compared to 17 per cent of those whose father had a white-collar job. The tendency on the part of students with white-collar fathers to vote Liberal can be interpreted as being due either to the general liberalization of students, or to the influence of the national political climate under the Liberal party. None of the measures of social class made any difference to the 14 percent support which is expressed for the N.D.P. This testifies to the fact that the N.D.P. has a low-level of appeal for the working, as well as the middle class, students.

The question to be asked is how these students differ from their parents in their choice of political party? Further, how does the national political opinion climate, generated by the party in power, affect the student's political party choice?

The data substantiate many earlier findings that the overwhelming factor influencing youth's political party choice is the voting choice of parents. As is shown in Table 4, the Liberals have a higher "retention rate" (i.e. the percentage of students identifying with the party of their father) than the Conservatives (63% versus 45%).

TABLE 4
FATHERS' REPORTED PARTY CHOICE AND PARTY CHOICE OF STUDENTS

Father's Party Choice	Percent Students Choosing Same Party as Father	N
Progressive Conservative	45	272
Liberal	63	414
New Democratic Party	55	22
Undecided	39	298

If, as has been suggested, a new generation tends to affiliate with the party in power during its political socialization, we should find not only an increase in the rate of retention of this new generation for the Liberals; but, also an increase in the rate of conversion amongst those of Conservative parents, to the Liberals.

TABLE 5
THE OVERALL COMPARISON OF FATHER'S REPORTED PARTY CHOICE
AND PARTY CHOICE OF STUDENTS

Student's Party Choice	Father's Party Choice			
	Conservative (N=272)	Liberal (N=414)	N.D.P. (N=22)	Don't Know (N=298)
Progressive Conservative	45	7	—	17
Liberal	21	63	5	33
New Democratic Party	13	14	54	11
Undecided	21	16	41	39
Total Per Cent	100	100	100	100

$\chi^2 = 279.83$; 9 df, $p < .001$.

Cramer's V = .30.

Table 5 presents the overall comparison of students' political party preference and that of their parents. Of significance are findings that only seven per cent of children of Liberal parents would vote for Conservatives as compared to twenty-two percent of youths from Conservative parents who would vote Liberals. The findings seem to substantiate Levin's contention about the influence of the national political climate on the choice of political party.

One qualification should be made, however, before making such a generalization: we contend that the student's political self-definition intervenes in the relationship between parental political affiliation and the student's voting preferences. That is to say, the difference in the reten-

tion rate might be an artifact of the differential political self-definitions among these students.

TABLE 6

FATHER'S REPORTED PARTY CHOICE AND PARTY CHOICE OF STUDENT,
BY STUDENT'S POLITICAL SELF-DEFINITION†
(in percentages)

STUDENT'S POLITICAL SELF-DEFINITION					
Student's Party Choice	Conservative*		Liberal**		Total
	Father's Party Choice Conservative (N=98)	Liberal (N=49)	Father's Party Choice Conservative (N=93)	Liberal (N=270)	
Progressive					
Conservative	81	29	34	5	27
Liberal	13	49	43	80	58
New Democratic Party	6	22	23	15	15
Total Per Cent	100	100	100	100	100

* $\chi^2 = 38.07$; 2 df, $p < .001$. ** $\chi^2 = 64.99$; 2 df, $p < .001$.
Cramer's V = .51. Cramer's V = .42.

† Note: For computational purposes students who were undecided on their choice of a political party and the students whose fathers voted for the N.D.P. were excluded.

Table 6 shows that, when the students' political self-definition is controlled, the Conservative and the Liberal party have a similar retention rate (80% versus 81%). According to our data, however, the Liberal party shows a higher overall rate of retention than the Progressive Conservative party does. Although these data involve only one community, they are sufficient to call in question the hypothesised influence of national political climate, at least among students in Maritime Canada.

For the politicians, as well as academicians, two questions remain. First, how is the "alienated voter" likely to vote in an election? and second, where would the votes of those who "know-nothing" about politics go? The "radicals" might argue that the alienated voters will choose the N.D.P. since it represents an "alternative" to the status quo. In the same vein, "critics" might argue that the bulk of the know-nothing voters "who want to jump on the bandwagon" tend to swing the pendulum of an election in favor of the Liberal party now in power.

To explore these questions, we utilized our alienation and political knowledge scales. If the critics' opinions were true we should find the bulk of alienated students choosing the N.D.P. and the bulk of the "know-nothing" voters choosing the Liberals. Table 8 shows the voting patterns of students, controlling for alienation and political knowledge

TABLE 7
POLITICAL PARTY CHOICE WITH ALIENATION AND POLITICAL
KNOWLEDGE AMONG UNIVERSITY STUDENTS
(in percentages)

Party Choice	Alienated*		Unalienated**		Total (N=1006)
	Political Knowledge High (N=200)	Low (N=310)	Political Knowledge High (N=279)	Low (N=217)	
Progressive Conservative	19	27	14	20	20
Liberal	37	42	46	40	42
New Democratic Party	23	7	18	10	14
Undecided	21	24	22	30	24
Total Per Cent	100	100	100	100	100

* $\chi^2 = 26.48$; 3 df, $p < .001$.

Cramer's V = .23.

** $\chi^2 = 10.80$; 3 df, $p < .02$

Cramer's V = .15.

simultaneously. In Table 7 we can detect only a slight tendency in favor of the above hypothesis. There are various ways of interpreting Table 7; but, briefly, it appears that the Liberal party tends to get its greater support (46%) from the unalienated and high political-knowledge group. The N.D.P. tends to be supported more by the alienated and high political knowledge group (23%). The Conservatives, on the other hand, tend to find greatest support amongst the alienated low political knowledge group (27%) and least support amongst the unalienated who have high political knowledge. The differences, however, are not so great to allow us to generalize beyond our data.

To the extent that these students identify the Liberal party as the party of the middle class, aspirations for social mobility might account for the greater loss by the Conservatives. It is also of prime importance to include in the operational definition of national political opinion climate, besides the party in power nationally, the general political mood of a nation in an historical epoch. Many people, especially students and the young, would like to define themselves as liberals and this self-definition would affect their voting behavior on the national level. Although there is now a federal Liberal government, it is accompanied by a national political mood in a direction favorable to the Liberal party.

Discussion

This research has generally supported the effect of national political climate defined by the party in power at the national level and the general political mood of the voter. Amongst all the variables considered, student political self-definition and parental political affiliation are the best predictors of his party choice.

In considering these data, two purely speculative notions are discussed: first, assuming that the greater retention rate of the Liberals is a consequence of the students' aspiration for social mobility, such a process might be necessary to maintain a clear majority. It is possible that upward mobility leads children of the working class to move to the middle class party thereby assuring the majority necessary for an effective federal government.

Second, the effects of national political opinion climate also seem to make for stability at the federal level while permitting the continuation of differential party choice at the provincial level. When a majority party at the national level retains a high proportion, and the minority parties a lower proportion, of the next voting generation, the results will be a relatively stable alignment. Moreover, it appears that, during the time when most of the consumers can buy what they want (with cash or credit) and the leisure-oriented youth can get some pocket-money (through programs such as Opportunities for Youth), the rhetoric of the federal minority parties about "full-employment," inflation, and recession will only appeal to a small audience among these youth.

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Selecting Instructional Materials to Meet Students' Reading Performance Level

Three major approaches to the selection of appropriate level reading instruction materials are described and evaluated. Strengths of each procedure are noted, as well as sources of weakness in test construction, administration, and the interpretation of scores. Specific suggestions are made with a view to improving reliability and validity. Use of the cloze procedure in selecting reading materials is recommended, since cloze appears to combine the advantages of both standardized and informal procedures.

Programs designed to individualize instruction in social studies, mathematics, science, and English usually require going beyond the single text to a variety of sources. Texts, tradebooks and other materials often appear suitable in topic content and interest, but more information on their readability is often needed. Specifically, one may wish to ask these questions: Could the selection under consideration be read with understanding by any one student in the class? By a small group? By most students? By all? The number of copies purchased, the use made of the book, and the need for alternative materials will depend to some extent upon the answers to the previous questions.

Three major approaches to selecting appropriate level reading materials will be discussed:

1. Readability—Standardized Test Procedure
2. The Informal Reading Inventory
3. The Cloze Procedure

Readability—Standardized Test Procedure

Determining Readability

The readability of a text is sometimes provided by the publisher in the form of a recommendation that the material is suited to a school grade; for trade books, an age-interest-suitability is more frequently pro-

vided; occasionally a readability formula is referred to, and an estimate of readability provided, representing, one would hope, the mean of several sample indices from the reading materials in question. Quoting such an index or mean readability of a book as *the* readability, however, may too often lead the prospective buyer into the false sense of security, that no parts or few parts of the book are more difficult than the (average) readability quoted. Much to be preferred would be the provision, also, of the *range* of difficulties within the book, as well as a statement of the number of samples taken to provide the data.

Estimating the readability of a book is only a first step. One must also assess the varying performance levels at which the book's potential readers function.

Assessing Performance Through Standardized Tests

Harris (1965) suggests that standardized reading tests can be used as an "aid in the selection of reading materials of appropriate difficulty," with grade scores "tending to show the instructional level" of the student to which an appropriate match can be approximated with materials of ascertained readability. Admittedly this is a process of approximation which includes error components from several sources—the less than perfect stability, homogeneity and validity of any test, as well as the less than perfect validity of the readability formula used, and any inaccuracy in its application. Substituting use of an informal inventory of unproven reliability or validity would appear unlikely to reduce error, although it might be supported in other ways, to be discussed later.

Difficulties

Heilman (1967) contends that students, in responding to standardized (silent) group reading tests, do not require complete understanding to get correct answers. This statement can be supported by advancing the possibility of random correct scores, and also of obtaining a correct response on every item through only partial knowledge, although such a distribution with no more than partial comprehension of every item would seem rather unusual, to say the least.

Harris (1965) suggests that poor readers tend to guess more than good readers and that their scores may then be overestimated on standardized tests.

If in contrast, one takes Goodman's (1970) position that reading is a "psycholinguistic guessing game," the point might be taken that the good readers guess more effectively than the poor readers. It would certainly seem plausible that good readers would make more effective use of minimal knowledge than poor readers. On the other hand, it is possible for a score to be inflated by correct answers obtained by random choice. Such effects can be minimized by built-in penalties for guessing. Exact-word completion response requirements, of course, foreclose this abuse, but appear to necessitate hand-scoring.

Recent evidence presented by Mitchell (1967) Weaver and Bickley (1967) and Bradley (1970), support the contention that reading compre-

hension tests are measuring general knowledge as well as a variety of influences connected to the test *questions* in addition to the assumed task—the ability to answer items from cues in the reading passage.

While it might be contended that extent of general knowledge as well as the ability to gain information from test questions are, perhaps, indicators of reading comprehension, the phenomena would appear to inject error into such tests in that they are not measuring in toto what is assumed—comprehension of a set of passages. A logical remedy would seem to be the removal of multiple choice formats in reading tests, with information gain indicated through the cloze procedure.

Parenthetically it might be suggested, in jest, that the findings cited above imply, also, the possibility of conserving considerable test form space and paper, through eliminating the passages and marking responses on a set of multiple choice statements in isolation.

It would seem quite possible, however, that the question-answering process approaches quite closely what can be termed verbal ability or verbal intelligence. If this be so, then some error is thereby introduced, although the net effect in predicting comprehension for specific materials would not appear to preclude use of such tests for that purpose, due to the known high correlation between verbal intelligence and reading comprehension.

Improving Test Selection

Chall (1970) has suggested a practical maneuver to increase the effectiveness of standardized test use. Since standardized tests are mainly designed for a spread of a few grades, they tend to give an inaccurate estimate of the high achiever through ceiling effects, and to be unreliable for the poorest readers through too few items at his level. Chall suggests that test selection for students who tend to score at the extremes should be made on the basis of their estimated reading level rather than on grade placement.

A grade six youngster, for example, who might be expected by his teacher to score at the grade nine or ten level on test forms addressed to the intermediate grades, would be given, instead, a test form designed for high school students. Similarly a student in the fifth grade having considerable difficulty in reading would be administered a primary grade form, probably followed by individual testing as well.

The Informal Reading Inventory

Face Validity

Asking a student to read selections aloud and at sight would appear on the surface, perhaps, as a very direct, practical, and appropriate method of matching the difficulty of a book with a student's reading performance level. It has one appealing advantage over the use of standardized tests, group or individual, oral or silent: no error is introduced in making a readability estimate nor in matching it with test scores, since the testing is done with the materials for instruction, and no readability estimate needs to be made.

Criteria Validity Questioned

Powell (1971) has presented evidence based on two comprehensive empirical investigations carried out at the University of Illinois (Powell, 1969; Dunkeld, 1970), supporting his contention that the conventional informal word recognition criterion (95%), for the instructional level, is unduly stringent.

Difficulty of Administration

Teachers, even after intensive training, appear unable to gain sufficient proficiency in test administration, in recognizing oral reading errors and in interpretation of results (Emans, 1965; Ladd, 1961).

Such lack of uniformity in test administration, scoring and interpretation of results, would appear likely to introduce considerably more error variance into informal testing, in contrast to the use of standardized tests where a great effort is usually made to make administration, scoring, and interpretation clear-cut and unambiguous.

Unrealistic Construct of Reading Performances

A basic question is that of validity: Can one select materials to be read *silently* on the basis of *oral* reading performance? Probably not, beyond grade one. Spache (1969), for example, summarizes considerable data to support the concept of a trend toward a smaller relationship between oral and silent reading ability as students mature, with the prediction of silent reading from oral reading errors approximately 36% better than chance in the elementary grades and 25% better than chance in high school. Similarly a recent study by Becker (1970), with fourth grade pupils, included the findings that those students with the lowest comprehension scores made the fewest oral reading errors, while the best comprehenders made the most errors in word calling.

One may conclude that scoring word recognition errors in a student's oral reading does have a purpose—it provides a record of the kind of word recognition errors made by this student in a specific but somewhat artificial (sight) reading situation; a record possibly of value in diagnosis and prescription of word attack instruction.

Scoring word attack errors does not appear to be a useful practice, however, if the purpose of the reading is to discover whether the material is at a suitable comprehension level, i.e. whether, for example, a particular social studies book is appropriate for this youngster's reading performance level. If oral reading is to be used, the criterion for instruction should be based on the percentage of comprehension questions answered correctly, generally 70% (Powell, 1969), or 75% (Johnson and Kress, 1965).

The situation is still somewhat artificial, in that one is asking a student to answer questions after reading aloud, when most of the reading he will later do on the materials in question will be silent reading.

Advantages of an Oral Format—Informal or Standardized

There are, however, two advantages in an oral format which should bring it into use where advantageous: (a) the teacher listens to the student

reading aloud and knows the student is attacking the words rather than indulging to a variable extent in off-task behavior; (b) the teacher asks the student the comprehension questions eliminating the possibility that the student cannot, or does not read each question. It is possible, of course, to ask a student to read a selection silently and then to respond to oral questions, thus eliminating the questionable practice of evaluating oral reading for silent reading purposes. Greater control is also thus maintained over the question-answer process.

Comprehension Questions—Guidelines for Construction

It remains necessary to compose a variety of questions for each passage, in sufficient number to ensure a modicum of reliability, and of sufficient quality to ensure measurement of what one wishes to define as comprehension. Questions must also be formulated in such a way as to preclude the possibility that the student may obtain the correct responses through the questions themselves or through previous experience rather than from the passages in question.

Care must be taken that questions posed on selections can be understood either through reading or listening, depending upon the input medium used, since it is assessment of comprehension of the passage read that is our task, rather than the evaluation of the student's ability to read the questions.

Evaluation of Oral Reading—Uses and Limitations

Identification of appropriate reading material through the observation of oral reading would, then, appear beset by many difficulties, making its use most appropriate as a diagnostic and supplementary evaluation procedure.

The Cloze Procedure

A variety of studies indicate the validity, reliability and utility of the cloze procedure in evaluating a student's comprehension of reading selections. Extensive description and criticism of this research can be found in Bormuth (1968), Greene (1968), and Rankin (1964).

Bormuth (1968) suggests the following procedures as most useful, "when validity, economy and convenience are considered simultaneously":. Every fifth word of the passages under consideration should be deleted, to be filled in by the student as he reads. This deletion ratio provides the maximum number of items for a passage ensuring reliability, while at the same time keeping the test to a minimum length (250 words is recommended). Answers are scored correct only when they match the deleted words, ignoring minor misspellings. If the student answers are correct on 40% or more of the deletions, the materials can be considered of appropriate difficulty for teacher directed instruction. When the student scores 60% or more, the material can be considered suitable for his independent work or study (Bormuth, 1967, 1968; Rankin and Culhane, 1969; and Lockerbie, 1969).

It is recommended (Bormuth, 1968) that a book to be evaluated through

cloze should first be sampled by administering cloze tests from six to twelve random samples of approximately 250 words, retaining for use that test having a mean closest to the mean of all tests. It seems unlikely that many teachers would be willing to engage in test production and administration to this extent, for the purpose of assessing the difficulty of one book with students, although it is possible such a procedure might be followed by a reading coordinator or similar person, to develop suitable school-wide tests for texts in common use. Copies could then be available in each school for duplicating and use by teachers.

A less time-consuming sampling process would be the following—six to twelve, 250 word samples might be selected randomly with two or more from the first third, the middle third, and the last third of the book. Readability of each sample could be calculated by some direct procedure, for example, Fry's (1968) readability graph. A 50 item cloze test might then be constructed from that sample closest to the mean readability of the samples examined. A student successful in 40% or more of his responses—20 answers correct, can be considered to be at the instructional level in this material. A student scoring 60% or more—30 or more correct responses can be considered at the independent level in this material. When a cloze test is administered to a group of children, similar safeguards should be taken as with any other group test. Particular care should be taken that students understand the directions, and that they are "on task" in attempting to replicate the author's message. Individual testing is to be advocated with students who for any reason would be handicapped on the test in a group situation. Re-testing on an individual basis and/or cross-checking by means of an informal inventory approach based on the same passages is indicated where individuals scores appear suspect.

Summary

Standardized test grade scores can be considered a rough estimate of a youngster's reading performance. Reading material can be approximated to this level through comparison of readability indicated, and grade scores, although this process combines the error inherent in any test with the error component of the readability formula and its application.

Informal (oral) evaluation procedures, beset by problems of scoring and interpretation, undetermined reliability, and an artificial construct of reading performance (oral sight reading), would appear least suited to identification of a silent reading performance level.

The Cloze Procedure appears to combine the advantages of both standardized and informal test procedures—the reliability, validity and much of the scoring ease of the former, with the pertinence and relevance of the latter, in that passages are constructed from instructional materials actually to be used by students.

Cloze would appear a valid and reliable tool to ascertain reading comprehension of instructional materials of most students beyond the first grade. Use of the Cloze Procedure is also considerably more convenient and considerably less time-consuming than use of the Informal Reading Inventory.

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The Effects of Human Relations Training On Teacher Interpersonal Skills

The study was undertaken to assess the effects of inservice human relations training on teacher interpersonal competence. The investigation was based on the assumption that the ability to increase significantly teacher interpersonal skills would also directly affect student development in a positive manner. The results of the study indicated the teachers gained significantly in interpersonal skills in a counselling relationship but that the acquired skills did not transfer to classroom interaction. The findings are discussed in a broader theoretical and empirical framework.

The children called upon us as persons, and we responded as persons. School was not a parenthesis inserted within life, but was actually an intensified part of life. It was just this, of course, that made the job so wearing for the teachers. But it was just this, too, that was the one source of every good thing that happened (Dennison, 1969, p. 33).

Some educators are arguing today that teachers must be able to respond openly with their students if any meaningful learning is to occur. The argument is not a new one. In the fourth century Augustine felt that learning occurs from the teacher-pupil relationship being a "mutual dwelling in each other", rather than teacher domination of student behavior.

In the nineteenth century Froebel articulated the need for the teacher's capacity to respond warmly and genuinely. Castle (1970) summarizes his position:

He reminds us that there lies deep in most human encounters in home and school a challenge that cannot be met with any slick response. And in this image of the teacher as the trustee of the child's capacity for self-direction, he reveals him as the supremely sensitive practitioner, not in the mechanical manipulation of teaching aids but in the intuitive control of the two-way traffic between maturity and childhood (p. 134).

Reminiscent of Augustine's "dwelling in each other" Martin Buber in this century developed the importance of the I-Thou relationship as a basic necessity to human growth. Finally, Abraham Maslow (1968) and the humanistic psychologists have argued that a "receptive" model of teaching is more conducive to growth than an "intrusive" model:

Above all, we would care for the child, that is enjoy him and his growth and self-actualization. So far this sounds much like the Rogerian therapist, his congruence, his openness and his caring. And indeed there is evidence by now that this "brings the child out," permits him to express and to act, and to experiment and even to make mistakes: to let himself be seen. Suitable feedback at this point, as in T-groups or basic encounter groups of non-directive counselling, then helps the child to discover what and who he is (p. 693).

In other words, teacher genuineness and empathy are conducive to the development of the student's own identity. There is now empirical evidence (Rogers, 1969; Truax and Carkhuff, 1965) to support the generalization that teacher empathy, respect and genuineness are positively correlated with student achievement and development. This investigation, then, was undertaken to assess the effects of a human relations program designed to increase the teacher's capacity to be empathic, respecting and genuine and was based on the assumption that the ability to increase teacher empathy would also directly affect student achievement.

Background to the Study

Two studies by Aspy (1965, 1967) are representative of the research that has been supportive of the stated assumption. In the earlier study Aspy studied the influence of teacher empathy, congruence, and regard on the reading achievement of 120 third-grade students. Aspy controlled for student ability by correlating the core conditions with high and low IQ students. The teachers tape-recorded their reading groups fifteen minutes each day during one week in March and again one week in May. The tape recordings were "blindly" analyzed by three experienced raters who employed the Truax and Carkhuff (1965) rating scales. The results indicated that high levels of teacher empathy, congruence and regard were related to higher student achievement on the Stanford Reading Achievement Test.

A later study by Aspy and Hadlock (1967) confirmed and extended Aspy's previous findings. Students taught by teachers high in empathy, warmth, and genuineness showed a reading achievement gain of 2.5 years during a five-month period while pupils taught by low condition teachers gained only 0.7 years. The truancy rate in classes with low-condition teachers was twice that occurring in high condition classrooms.

The findings of the two studies cited above as well as other studies (Christensen, 1960; Schmuck, 1963; Truax and Tatum, 1966, and Hefele, 1969) have indicated a correlative relationship only. Due to the inherent difficulties in controlling for all other factors affecting student development, a causal relationship cannot be asserted. However, since the evidence has been consistent with regard to the correlation described and due to the equivocal findings relating other teacher characteristics

(Grannis, 1970) to student achievement the ability to affect teacher empathy, respect and genuineness is valued as a constructive variable for teacher training.

The training selected for the study was the Carkhuff method (1969). It was selected over other types of human relations training for three reasons. In brief, these reasons included: first, the Carkhuff method focuses on the conditions conducive to student development; secondly, there is a reasonable amount of evidence to support the effectiveness of the Carkhuff training method with different samples, with approximately twenty studies (Carkhuff, 1969; pp. 301-310) indicating the overall effectiveness of the Carkhuff method; and, thirdly, the Carkhuff training method involves a structured format and is thus repeatable from one group to another. The Carkhuff training method is not unlike other methods in that small groups of eight to ten people discuss personal and/or professional problems under the guidance of a trainer. What differentiates it from T-grouping and encounter grouping is the employment of research scales which channel group interaction into one or more of the following dimensions:

1. empathic understanding
2. respect
3. genuineness
4. specificity of expression
5. self-disclosure
6. confrontation
7. immediacy.

The specific dimensions chosen for a particular training program depend on the group involved and the amount of time available for training. As to format, most Carkhuff training sessions will involve one group member acting as a helpee and one member as a helper. The helpee will either state something of real concern to himself or role play some type of situation. The helper in responding to him will attempt to communicate effectively using one or more of the scales to guide his responses. For example, in responding to the helpee's statement he might use the empathy scale to "respond with accuracy to all the person's deeper as well as surface feelings." After the helper has completed his response, the other members rate his response using the empathy scale as a guide for rating. Thus the scales form the basis for the two main elements in the Carkhuff program: communication training and discrimination training.

An excerpt from a Carkhuff session might elucidate the procedures. For example:

Trainee 1 acting as helpee: Uh, it's an empty life. It's, um, there is, uh, no depth to it at all. I mean you just talk about very, very superficial things, and the first few times, it's O.K. But then after that, there's nothing to talk about. So you drink and you pretend to be happy over silly jokes and silly things that people do when they all, uh, are trying to impress one another, and they're very materialistic, and uh, it's just not the route I want to go.

Trainee 2 acting as helper: So your feelings are so strong that you just can't fake it any more (Carkhuff, V. I, p. 219, 1969).

Trainer: O.K. How would you rate the helper's response on the empathy scale?

Trainee 3: I'd give him a three

Trainee 4: Three point five

Trainee 5: Three

Trainee 6: Four

Trainee 7: Three point five

Trainee 8: Three point five.

The trainer would then communicate his rating and provide the rationale for it. This pattern would then be repeated with other trainees acting as helper or helpee and using other rating scales to shape and discriminate responses. The trainer might also participate as a helper to offer a model for effective interpersonal functioning. (For further clarification, the response of Trainee 2 in the above excerpt is the communication phase of training and the trainees' ratings of his response is the discrimination phase.)

The trainer plays an important part in the training as he must be familiar with the scales and have developed a certain amount of expertise in implementing them for training purposes.

Method

Sixteen elementary school teachers volunteered to participate in the study. Since a training session can only accommodate 8-10 people the sample was necessarily small and thus the findings were limited. The sixteen teachers were randomly assigned to an experimental group or a control group. The experimental group received 18 hours of Carkhuff training held during an intensive weekend program. The trainer was experienced in the Carkhuff method and had been previously rated at a level on the Carkhuff scales necessary for trainer effectiveness. Due to the limited length of the program, the trainer concentrated on four dimensions: empathy, respect, genuineness and specificity of expression. Since there is more evidence indicating the applicability of these four dimensions to teaching effectiveness, they were selected for this particular training program.

Three instruments were administered. Two of the instruments assessed the effects of training in a one-to-one counseling relationship. The instruments included the communication index and the discrimination index which have reliably assessed communication and discrimination skills in a number of studies (Carkhuff 1969; pp. 94-132). The communication index contains sixteen written expressions to which the teachers wrote a helping response for each expression. As an example, one of the excerpts used in the index is:

Helpee: I don't know if I am right or wrong feeling the way I do. But I find myself withdrawing from people. I don't seem to socialize and play their stupid little games any more. I get upset and come home depressed and have headaches. It seems all so superficial. There was a time when I used to get along with everybody. Everybody said, "Isn't she wonderful. She gets along with everybody. Everybody likes her." I used to think that was something to be really proud of, but that was who I was at that time. I had no depth. I was what the crowd wanted me to be—the particular group I was with.

Each teacher response was then rated on a scale from one to five and the mean of these sixteen ratings formed the communication index. The discrimination index contains the same sixteen excerpts, each being followed by four responses: the teachers rated a total of 64 responses using the gross rating scale as a guide (Carkhuff, 1969, v. I, p. 115). The teachers' ratings were then compared with a key developed by experienced raters to determine the mean deviation from the key ratings (Carkhuff 1969, v. I, p. 127). Thus, an improvement in the discrimination index is indicated by a lower score or deviation from the key ratings. The third instrument was the Carkhuff rating scales; these were used to assess teacher empathy, respect, genuineness and specificity of expression in the classroom. The empathy scale runs from one to five. At the lowest level, "the first person appears completely unaware or ignorant of even the most conspicuous surface feelings of the other person. . . ." At the highest level the first person ". . . almost always responds with accurate empathic understanding to all of the other person's deeper feelings as well as surface feelings." Respect or positive regard involves a five point scale running from the lowest level where the ". . . first person is communicating clear negative regard for the second person . . ." to stage five where the first person "communicates a very deep respect for the second person . . ." The genuineness scale runs from level one where ". . . the first person's verbalizations are clearly unrelated to what he is feeling at the moment, or his only genuine responses are negative to what he is feeling as regards the second person . . ." to level five where the first person ". . . is freely and deeply himself in a nonexploitative relationship with the second person." Personally relevant concreteness or specificity of expression is defined by a five point scale where at the lowest level ". . . the first person leads or allows all discussion with the second person to deal only with vague and anonymous generalities . . ." and at the highest level the first person ". . . is always helpful in guiding discussion so that the second person may discuss fluently, directly and completely specific feelings and experiences . . ."

The teachers' classes were recorded for approximately fifteen minutes per day for an entire week so that there was a total time of an hour per week before and after the training session. Two three-minute samples were randomly excerpted from each one-hour tape. Thus, each teacher was rated on two segments, each three minutes in length before the training as well as two three-minute segments after training. This procedure was developed by Carkhuff (1969), and is based on evidence that reliability, range and discriminatory power of ratings are generally independent of segment length (Kiesler, Mathieu, and Klein, 1964). Each excerpt was then rated by two raters independently of each other and without knowledge of whether the ratings were pre- or post ratings.

In general, it was hypothesized that in comparison with the control group the experimental group would gain significantly in communication and discrimination skills in the counselling situation and manifest these skills in classroom interaction.

The Results

Generally, the results indicate that the training was effective in enhancing communication and discrimination skills in the counselling setting, since t-tests on mean gain scores were significant for both the indexes. These data can be found in Table I.

TABLE 1

	Pretraining Mean	Post-training Mean	t-test On Gain Score	P
Communication Index				
Experimental Group	2.20	2.78	2.26	.025
Control Group	2.09	2.15		
Discrimination Index*				
Experimental Group	1.13	.74	3.31	.01
Control Group	1.18	1.13		

* Low scores indicate *greater* discrimination ability.

The results, however, from the classroom data were negative. As the data in Table 2 indicate, the t-tests on the gain scores for the overall mean as well as on the individual dimensions (empathy, respect, genuineness, and specificity) were not significant. Indeed, all the means regressed from pretest to post-test. In the case of empathy the drop in score was significant for both groups.

TABLE 2

Means and Standard Deviations of the Pre- and Post-classroom Ratings for the Experimental and Control Groups

Dimensions	Experimental		Control	
	Pre	Post	Pre	Post
Overall Ratings				
Mean	2.29	2.10	2.05	1.87
S.D.	.51	.63	.38	.27
Empathy				
Mean	1.92	1.60	1.68	1.35
S.D.	.57	.50	.39	.17
Genuineness				
Mean	2.67	2.45	2.58	2.34
S.D.	.45	.55	.33	.31
Respect				
Mean	2.63	2.44	2.42	2.35
S.D.	.58	.31	.53	.35
Specificity				
Mean	1.94	1.88	1.52	1.45
S.D.	.77	.89	.53	.58

Discussion

The findings suggest the training was successful in enhancing communication and discrimination skills in a counselling setting but not in developing interpersonal skills for classroom interaction. This contrast concerning the effects of training is presented in Figure 1 where the communication index mean and the overall classroom rating mean are compared. One explanation of this phenomenon is that, although the training improved teacher interpersonal functioning, the school simply did not provide the environment for the change to take place.

The results are suggestive only, since the limitations of the study prevent any conclusive inferential statements from being drawn. A more reasonable approach is to refer to other literature which may help clarify alternative explanations for this finding.

Institutional Pressures and Interpersonal Relations

Philip Jackson (1968) from a number of observations carried out in elementary school classrooms has drawn some conclusions which may be helpful in understanding the findings of this study. Jackson's observations led him to the conclusion that "the dominant relationship in the classroom is quite impersonal when compared with that which goes on in the home" (p. 29). Because public school classes are often large, and because teachers are often concerned about classroom control, there is very little opportunity for teachers to establish meaningful relationships with their students. Adding to the impersonality, the teacher, in order to "teach effectively", may require that the students not communicate with one another except in a prescribed manner. As Jackson puts it, "In a sense, then, students must try to behave as if they were in solitude when in point of fact they are not" (p. 16). The classroom organization and institutional "climate" are therefore not conducive to teacher empathy.

Fuller's (1969) review of six empirical studies supports Jackson's conclusions that teacher emphasis on class control overrides other considerations:

As it is reported by these investigations, what we know is that beginning teachers are concerned about class control, about their own content adequacy, about the situations in which they teach and about evaluations by their supervisors, by their pupils and of their pupils by themselves.

The consistency of these findings is remarkable in the light of the different populations surveyed. The consistency lies not only in the similarity of concerns expressed but in the absence of concern about topics which are usually included in education courses: instructional design, methods of presenting subject matter, assessment of pupil learning dynamics of child behavior and so on (p. 210).

Similarly, McAulay (1966) reports from a survey of 648 elementary school teachers that eighty percent said they did not deal with controversial issues in their social studies programs. A common explanation for their reluctance was that the children get out of hand "when we discuss something unusual like that" (p. 29).

At a more general level, Argyris (1968) has pointed out how difficult it is to gain interpersonal competence when one's survival needs are high:

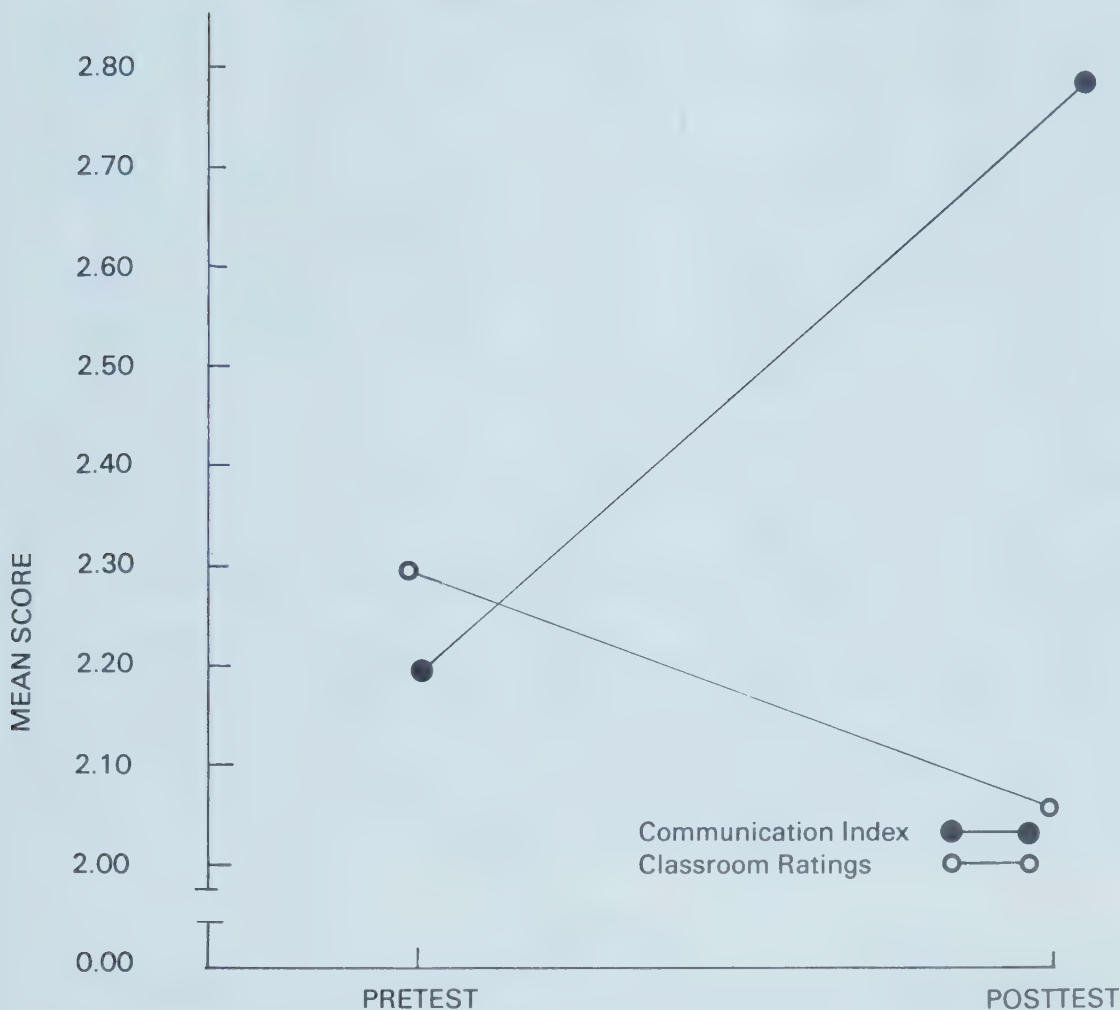
For example, the writer's interpersonal competence scores have been found to vary immensely depending upon the situation in which he was placed. Quantitatively his scores have ranged from 150 to 390, where the lowest score obtained is 10 and the highest 390. Interpersonal competence, therefore, is an interpersonal or situational ability and not simply an individual or personal ability (p. 149).

These data might support the conclusions drawn by Jackson and Fuller since the pressures of adequate lesson planning and the need to maintain discipline rate high as teacher "survival needs" and thus hinder teacher interpersonal competence.

Finally, Newmann and Oliver (1967) have suggested that the architectural structure and administrative design of the school may contribute to ineffective interpersonal relations. They point out that schools are often modeled after office buildings and factories where the students travel down corridors designed to handle traffic between different compartments. Administratively, the schools also resemble corporations with hierarchies of authority established with each individual (student, parent, teacher, principal, superintendent, and school committeeman) recognizing his duties within this framework. Activities are also organized into special categories: teaching (which is further compartmentalized into various subjects), administration, guidance, custodial services, etc. More particularly, education is packaged into equal and quantifiable units with classes of equal size, instructional periods of equal length, and standardized texts and lessons. In general, the institutional network that Newmann and Oliver describe may be another factor which could contribute to the inability of teachers to be empathic and genuine in the classroom.

The findings of this study are also similar to another study by Sutton (1968). In this study an experimental group experienced encounter grouping for a weekend and the effects were evaluated by the *Barret-Lennard Relationship Inventory*. The results were compared with two control groups. One control group consisted of teachers who volunteered for encounter grouping and a second group who did not volunteer. Neither control group experienced any form of training. Similar to the findings of this study, the three groups regressed with regard to empathy, congruence, and regard when assessed by the students. The regression that occurred over a five-week period was statistically significant for all groups. In other words, the students perceived the teachers as being less empathic after five weeks. Sutton attempted to explain this phenomenon by suggesting that the pretest measures were taken early in the year when the students' first impressions of the teachers were favourable. After five weeks, however, Sutton suggests these impressions must have faded. Perhaps a similar type of explanation could be made of the findings in this study. In short, the teachers' decline in interpersonal functioning could be interpreted as a sort of end-of-the-year phenomenon when teachers could be tired of teaching. In general, teachers at that time are probably more concerned with the coming summer than the final year-end demands.

FIGURE 1
Pretest and posttest mean scores on the communication index and the
classroom ratings for the experimental group.



The Training Methodology

It is also possible that the training was ineffectively designed to meet the needs of the classroom. Although the training was conducted with relevance to teaching skills, the fact remains that the training was done with adults performing the role of helpee. An alternative approach could incorporate microteaching situations with trainees rating each other on the Carkhuff scales after each microteaching incident. This would involve teachers working with students rather than with adults. In more general terms there is a need to develop training programs that focus on skills which are not removed from the social milieu where the trainees are working.

Finally, the training program may have simply been too short to

permit the skills to transfer to the classroom. Perhaps a training program over a longer period of time (six to twelve weeks) and constituting more time (thirty or more hours) would be more effective with feedback about classroom performance to the trainees.

*Implications of the Study for Teacher Education and
Suggestions for Further Research*

This study suggests that institutional pressures affect teacher interpersonal competence as well as the need for more data explicating the relationship between these two variables. For example, in view of Sutton's explanation it would be interesting to observe the effects of institutional pressures on teacher interpersonal functioning over an entire year. Perhaps certain "rhythms" could be detected so that inservice programs could be conducted at optimal times. In relation to the literature on institutional pressures (eg. Jackson; Newmann and Oliver; etc.) it would also be helpful to investigate the effects of school planning (eg. open vs. traditional) on teacher interpersonal functioning as well as the effects of class size, type of administrative network, and school architectural layout. It is interesting to note in this study that one of the two teachers in the experimental group whose level of interpersonal functioning *did* improve following on the training was teaching in an open plan school.

Finally, the data derived from the communication and discrimination index adds an additional piece to the large body of evidence supporting the effectiveness of the Carkhuff programs (Carkhuff, 1969) in improving counselling skills.

As noted earlier, the training needs modification if it is to affect teacher interpersonal skills in the classroom. However, even if a more effective program could be designed, it would be necessary to ascertain the effects of institutional pressures on interpersonal competence so that there would be greater conclusiveness concerning the probable outcome of training in different educational environments.

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Teacher Attitude as a Function of Locus of Control

Eighty teachers, attending an advanced educational psychology course were administered Rotter's I-E scale and Wehling and Charter's "Teacher Belief" questionnaire. Hypothesis predicted that those teachers scoring high on Rotter's "internal" scale would orient their belief system to "student autonomy", "integrative learning", "personal-adjustment ideology", "student challenge" and "consideration of student viewpoint". The "external" teachers were hypothesized to endorse "classroom order", "subject-matter emphasis" and "emotional disengagement". The statistical analysis did not confirm our hypotheses. In fact, the results showed the opposite effect. The "internal" teacher desired more control of his environment than did the "external" teacher. The study provides an explanation of these findings, forcing a reconsideration of some of the generalizations that have been made regarding locus of control. (Dr. H. L. Janzen is Assistant Professor in the Department of Educational Psychology, University of Alberta; Don Beeken is a graduate student in the Department of Elementary Education, University of Alberta, Dr. John Hritzuk is Associate Professor in the Department of Educational Psychology, University of Calgary).

The internal-external locus of control scale as developed by Rotter (1966) was an attempt to measure the extent to which a person believed that reinforcements were contingent upon one's own behavior ("internals") as opposed to being a mere result of fate, luck, or powerful outside forces ("externals").

A number of personal characteristics and expectations are often associated with the so-called internal or external individual. For example, Rotter (1966) suggests that an external individual perceives himself as relatively powerless to control his destiny. He feels more alienated from

the processes of his life and success and should therefore exhibit less achievement-oriented, striving behavior. The internal individual, on the other hand, believing that self-originated activity can be useful, is more willing to control his environment (or to exert the attempt). Rotter (1966) also suggests that an internally-oriented person should exhibit relatively more self-control. He may be more alert to his environment for data upon which to base his choices, and he should be more concerned with failure because he holds himself more responsible than would an external. The internal is also expected to see others more as he sees himself and to be considerate of their point of view.

The relationships mentioned above have persistently formed a basis for generating hypotheses, and explaining the results of research into locus of control and its relationship to other variables. It has not always been clear whether or not such statements are adequate and valid explanations.

Research relevant to the present investigation includes the work of Clouser and Hjelle (1970), who found a correlation between external locus of control and high scores on a dogmatism scale. External locus of control has been found to correlate positively with neuroticism (Platt, Pomeranz, and Eisenman, 1970), with manifest anxiety (Hountras and Scharf, 1970), and with blaming behavior (Phares, Wilson, Klyver, 1971). Lewis and Blanchard (1971) found that "internals" are resistant to subtle suggestions, and Bartel (1970) found that they attributed performance more to motivation than to ability. The results of a study by Weight (1970) suggest that "internals" are more confident in attributing good quality to an interpersonal relationship. Tseng (1970) found that they tended to make higher scores on scales which measured "compliance with rules", "ability to work with others", and "work tolerance". According to Hersch & Schiebe (1967), "internals" score higher on scales of dominance, tolerance, sociability, efficiency and well-being.

Problem

These findings, generalized to a teacher sample, suggested a number of hypotheses. It was expected that teachers classified as "internal" on Rotter's scale would also score high on measures of:

1. student autonomy
2. integrative learning
3. personal adjustment ideology
4. student challenge
5. consideration of student viewpoint.

It was predicted that teachers scoring as externals should score higher on attitude measures of:

1. classroom order
2. subject matter emphasis
3. emotional disengagement.

These attitude factors were derived from Wehling and Charters' (1969) questionnaire. The reliabilities of these factors were considered adequate (Wehling and Charters, 1969).

Method

Eighty teachers, attending an advanced psychology course at the University of Calgary completed Rotter's I-E scale and Wehling and Charters' Dimensions of Teacher Beliefs. The sample included teachers of elementary to senior high schools. The mean age was 35; average teacher experience was 5 years. The "belief" questionnaire provided measurements on the attitude scales referred to above. The eight dimensions of teacher belief were used as predictor variables of internal-external control.

Results

The teachers were classified as "internals" or "externals" on the basis of their scores. Subsequently a step-wise multiple regression analysis indicated that the following five factors, taken cumulatively, could be used to predict "externality" at a significance level of $p = 0.037$:

	Multiple R
1. student autonomy28
2. classroom order (1 + 2)30
3. personal-adjustment ideology (1 + 2 + 3)35
4. integrative learning (1 + 2 + 3 + 4)37
5. subject-matter emphasis (1 + 2 + 3 + 4 + 5)38

The results of this step-wise regression procedure, where variables below the 0.05 level of significance were *not* entered, failed to confirm the hypothesis that the measured attitudes of "student challenge" and "consideration of student viewpoint" were significant predictors of the "internal" teacher. In addition, the attitudes of "student autonomy", "integrative learning", and "personal adjustment ideology", believed to predict the "internal" teacher, in actual fact predicted the "external" teacher.

In the case of our second hypothesis, the attitude variables "classroom order" and "subject-matter emphasis" were found to predict "externality" as expected. The variable "emotional disengagement" was not a statistically significant predictor.

In order to clarify the extent of the relationships between the statistically significant attitude scales and Rotter's locus of control dimension, the following correlation matrix was obtained.

TABLE 1
CORRELATIONS OF ROTTER'S I-E SCALE WITH TEACHER ATTITUDES

	1	2	3	6	8	9
1 Subject Matter Emphasis	—					
2 Personal-Adjustment Ideology	0.02	—				
3 Student Autonomy	0.07	0.27*	—			
6 Classroom Order	0.26*	0.10	-0.24*	—		
8 Integrative Learning	0.12	0.55*	0.23*	0.31*	—	
9 I-E Scale	0.10	-0.01	0.30*	0.09	0.11	—

* significant at $p = 0.05$

The I-E scale is scored in such a way that the higher the score, the greater the tendency toward "externality". The correlation matrix indicates that the attitude variable "student autonomy" was the only one to correlate significantly with the I-E scale. The direction of the correlation shows that contrary to expectation, it is the "external" teacher who most endorses student autonomy.

Discussion

The significant correlation between subject-matter emphasis and classroom order (0.26) is in line with the expectation that a teacher who is concerned with curriculum would find an ordered class more suited to curriculum-oriented objectives. This finding is supported by the negative relationship between "classroom order" and the factor "student autonomy".

The results indicate significant statistical relationships between the dimension of "personal-adjustment ideology" and both "student autonomy" (0.27) and "integrated learning" (0.55). There is also a significant correlation between "student autonomy" and "integrated learning" (0.55), and between "student autonomy" and "integrated learning" (0.23). These three relationships form a rational and compatible group—possibly to be explained in terms of a concern for the individual child and his needs, especially in the area of developing responsibility. Such a concern would form part of an adjustment type of ideology in which the idea of encouraging student autonomy and free choice is seen as the basis of personal adjustment. Integrated learning not only correlates with the variables mentioned above ("personal-adjustment ideology", "student autonomy") but with classroom order (0.31).

Since the correlation between "student autonomy" and "externality" on the I-E scale is the main focus of this paper, an explanation of this relationship with reference to previous findings is warranted.

According to our findings, the "internal" teacher desires more control of his environment (in this case the classroom) than does an "external" teacher. This desire is manifest in his relative rejection of student autonomy. Oriented as he is to achievement, and being concerned with possible failure (Rotter, 1966, 1971), the "internal" teacher actively assumes responsibility for class control. Related to this would be a tendency to resist subtle coercion (Lewis & Blanchard, 1971), and any tendency on the part of the students to dominate, or weaken, the classroom environment. Because of the emphasis which the "internal" places on motivation, in contrast to ability, in explaining accomplishment (Bartel, 1970), we might expect him to consider student motivation as a very serious teacher responsibility. This attitude would not encourage any lessening of teacher responsibility by allowing student autonomy. The "internal" in general was found by Hersch & Schiebe (1967) to be dominant, assertive, independent, and efficient. These qualities would also be descriptive of a teacher who desires a controlled classroom. Such a teacher would probably be confident of his rapport with students (Weight, 1970) and unlikely to be neurotic (Platt, Pomeranz, Eisenman, 1970) or anxious (Hountras and Scharf, 1970). The "internal" is willing to comply with rules (Tseng, 1970) and shows a high score on the

Achievement via Conformance scale of the C.P.I. (Hersch & Schiebe, 1967). These qualities of compliance and conformity are not necessarily virtues: if manifested in a highly developed form they may indicate that the "internal" is less of an active innovator than we might hope, being less concerned with others than with his own situation. A tendency to be unable to see internal motivation in others could be one result of this lack of concern.

The "external" teacher on the other hand, believes that agents other than himself are responsible for life's events. We might assume that he feels more alienated from his destiny (Rotter, 1971). Less concerned with achievement, he is likely to accept failure calmly, secure in the belief that blame may be attributed outside himself (Rotter, 1966). Phares (1971) found that "externals" who had been "failed" on a standard test under normal conditions were more likely to exhibit blaming behavior (a defensive reaction) than in a condition which contained real distractions. Perhaps student autonomy functions analogously to the distractions in Phares' experiment: by allowing student autonomy he creates a less responsible and demanding situation for himself. The research of Lewis & Blanchard (1971) seems to support this hypothesis. The significance of this suggestion is that "externals" do not perceive subtly coercive situations as particularly threatening, indeed, they may welcome such situations. If flight from responsibility is characteristic of the "external," then one can easily explain his tendency to anxiety (Hountras, 1970) and neuroticism (Platt, et al., 1970). Indications that the "external" is less dominant, less assertive, more dependent, and more dogmatic (Hersch & Schiebe, 1967); Clouser & Hjelle, 1970) encourage the view that the "external" teacher is "pessimistic" about his personal power, fearful of responsibility, and consequently apathetic.

In summary: the "internal" teacher has been characterized as one who is concerned with, and believes in, his personal control. In contrast, the "external" has all but surrendered to "outside forces."

Both of these caricatures *seem unlikely* and it is our feeling that a closer consideration of the nature of locus of control could lead to a more realistic explanation.

Our findings indicate that the "external" teacher is aware of the importance of unpredictable or uncontrollable forces, and includes other individuals in this general view. Conceivably he is more aware of and alert to the environment than the "internal" is expected to be. No less than any other teacher, the "external" is aware that he holds a position of power in his classroom; however, it may be easier for him, not over-emphasizing self-assertion, to relinquish power and to consider the needs, goals, choices, basic individuality and freedom of others.

An internal locus of control manifests itself in a desire for control and in a strong sense of responsibility. These factors may make it more difficult for the internal to relinquish any control or possibly even to gain an objective viewpoint.

The present study forces us to reconsider some of the generalizations that have been made regarding locus of control. We are especially concerned with the question of whether the "internal" is actually more

willing and capable than the "external" of viewing others in the same light as he views himself. Is locus of control really representative of a philosophy of action or inaction? Does the individual who scores externally on the I-E scale really see himself as helpless and ineffectual, or is he expressing a belief in the nature of man in general—a belief which he may make use of in a very active and dynamic way? On the other hand, does an internal view also have such a generalizable philosophical basis or is it merely representative of a closed and personal belief in self-power? The results of our study seem to indicate that a passive, relatively unconcerned-with-others, "internal" is not an impossibility. Nor is an "external" who is active and innovative to be regarded as rare.

The notion that an "internal" would be more likely to view others as having qualities of internality, and therefore be more likely to respect their individuality and personal freedom, is seriously open to doubt. Our results indicate that the "internal" may be threatened by such a perception of others and react in a controlling and defensive manner. Perhaps further research would support the hypothesis that the "external" will be more accommodating in recognizing the individuality of others.

Clarification of the relationship between locus of control and activism is badly needed. Until we have some understanding of the reaction of internals and externals respectively to perceived freedom in others, "locus of control" will continue to be a poor predictor of interpersonal behavior, whether in teacher samples or in a more general class of subjects.

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Canadian School Life Tables

School life tables elucidate the relationship between age and school enrolment and allow us to present data in a standardized form for efficient comparison of "dropout" patterns between geographic areas. This paper provides us with the first set of Canadian school life tables and allows us to compare enrolment patterns in Canada, India and the United States. It reveals that Canadian children tend to begin their school life at a later age than U.S. or Indian children and that Canadian school participation rates peak a year earlier and thereafter decline more rapidly than U.S. rates.

I. Introduction

North American educators have spent a considerable amount of time and energy researching school dropouts, their causes, rates and consequences. They have found that dropouts correlate in varying degrees with intelligence (Tyler, 1956), academic performance (Havighurst, 1962), school attendance (Cerventes, 1965), grade failure (Hohol, 1955), discipline (Ede, 1967), socio-economic background (Hollingshead, 1949), geographic mobility (Zeran, 1962) and personality (Cohen, 1970). A basic consideration which has been overlooked in these studies is the incidence of dropouts by age that occurs at local or national levels. Such information would be valuable to educational planners whether they are concerned with the physical plant, the curriculum or with special programs. Planners at the governmental and post-secondary school levels would find data on patterns of secondary school dropouts by age and sex useful because such information combined with knowledge of the size of younger age cohorts would allow projections of future needs in post-secondary institutions as well as in the labour force.

A viable approach to the problem of detecting the incidence of dropouts involves tabulating the data in school life tables wherein a cohort of 100,000 births is followed through their school life span. Such a format would explicate the relationship between age and school enrolment. School life tables allow us to present data in a standardized form for efficient

comparison of dropout patterns between geographic areas or between periods of time in one area.

School life tables have been constructed for the United States by Stockwell and Nam (1963) and for India by Rao (1967) and by Premi and Chandra (1968), but none have previously been constructed for Canada. The procedure is similar to that used in constructing nuptiality (Mertens, 1965), labour force (Denton, 1969) and divorce tables (Krishnan, 1971). School life tables are a mixed-increment double-decrement type wherein the tables reflect gradual accession of the population into the school system and their separation due to mortality and dropouts. These two factors of attrition are treated in this table as being analytically distinguishable and mutually exclusive. Separation by mortality occurs when a person dies while attending school. Any other case of separation is classified as a dropout.

II. Methodology

The methodology in this paper replicates that of Stockwell and Nam in all but a few instances which will be pointed out later. The school participation of a large group of persons is traced from age four to age twenty-two, the youngest and oldest ages recorded for persons attending public schools in Canada during the period under investigation. As with conventional life tables, the school life table assumes an initial population of 100,000, although it documents only those who are attending. Members of the surviving population may enter school at various ages—usually 5, 6 or 7—and having done so, may leave at various ages due to mortality or dropout.

Two methods of determining life table rates include the "cohort" method and the "current" method. In the first technique a group of persons are followed through their life span and their ages at entrance to, and departure from, school are noted. The second method requires the tabulation of school participation rates and death rates at all ages in a given year. The school life table is then derived from these data. The latter method is most commonly used because of the availability of the data and the possibility of providing contemporary values. The results of the cohort method can only be compiled after the last individual in the cohort has left school.

Originally only 1961 enrolment data were used, but the derived participation rates were bimodal and could not be adequately smoothed using conventional smoothing techniques. Such procedures could be used to advantage once the average of the 1956 and 1961 rates had been taken. The danger of distorting the data is always present when smoothing formulas are used, particularly for curves which follow the pattern of school participation rates, experiencing rapid changes over a small age span. All standard smoothing techniques make use of values in the vicinity of the value to be smoothed under the assumption that these values change very little, and if they do change rapidly, they distort the value being smoothed. For this reason smoothing procedures should be avoided when possible and otherwise used with discretion to minimize their effect. This was accomplished by smoothing the school participation

rates as little as possible. A graduating formula was applied to ages 9 and 14 once, and 10 to 13 twice. The formula used was:

$$x'_i = 1/9(x_{i-2}) + 2/9(x_{i-1}) + 3/9(x_i) + 2/9(x_{i+1}) + 1/9(x_{i+2})$$

where x_i is the participation rate and x'_i the smoothed participation rate of age group i .

Such smoothing techniques were probably not used by Stockwell and Nam, who unfortunately do not describe the method they used.

III. Data and Findings

The school life tables in this paper are based on Canadian life tables, 1960-62, and on school participation rates for 1956 and 1961. These years were selected because they were the latest census years for which published data of school enrolments in Canada by age are available. The enrolment data refer to all elementary and secondary schools, which represent a wide cross-section of school systems in Canada because each province has the authority and responsibility for organizing its own education system while the federal government provides schools for Indian and Eskimo children and for children of National Defence personnel. For example, the number of grades a student was expected to pass through in 1956-61 varied from 11 in Newfoundland to 13 in Ontario, British Columbia and the Yukon. Furthermore, the availability of kindergartens differed from province to province, causing variation in the age at which students entered grade one. A second cause of regional variation was the provincial compulsory school attendance laws which required students to attend school during the ages 6-16 in Ontario, but only during the ages 7-14 in Saskatchewan. Such variations reduce the applicability of the ensuing school life tables to students in individual provinces and can only be validly applied to the Canadian school population as a whole.

This table can provide us with some insight into school life patterns of Canadian school children. School participation rates increase rapidly to a peak of 99 percent for persons 8-9 years of age, after which the rates decrease slowly until those ages when compulsory attendance laws become void during which the participation rates decrease rapidly.

The e_{sx} column, which depicts the expected number of school years remaining for persons who reach age x , reveals that between the ages of four and eight years, persons can expect to spend ten or eleven more years in school. The computed expectancies for these years change very little because only a small portion of the base population, 1_x , attends school before the age of seven. After age seven, the expected number of school years remaining decreases by approximately one year for each succeeding age cohort until age 18, at which age the school life expectancy is only 0.4 years. If the expected number of school years is converted to age at which separation from school occurs, it is found that persons between the ages of 7 and 17 can be expected to leave secondary school between the ages of 17 and 18.

It may be fruitful to compare this table with the 1957-59 United States school life table compiled by Stockwell and Nam and the 1960-62 table

TABLE 1
TABLES OF ELEMENTARY AND SECONDARY SCHOOL LIFE FOR THE TOTAL
POPULATION, 1956 AND 1961

Age	L_x	l_x	S_x	L_{sx}	T_{sx}	e_{sx}
4-5	96,878	96,915	.0025	242	1,060,296	10.940
5-6	96,814	96,845	.1189	11,511	1,060,054	10.946
6-7	96,756	96,784	.6477	62,669	1,048,543	10.834
7-8	96,706	96,730	.9701	93,814	985,874	10.192
8-9	96,660	96,682	.9877	95,471	892,060	9.227
9-10	96,619	96,639	.9805	94,735	796,589	8.243
10-11	96,581	96,639	.9751	94,176	701,854	7.266
11-12	96,542	96,600	.9733	93,964	607,678	6.293
12-13	96,502	96,561	.9700	93,607	513,714	5.322
13-14	96,460	96,523	.9547	92,090	420,107	4.354
14-15	96,410	96,482	.9359	90,230	328,017	3.401
15-16	96,352	96,437	.8661	83,450	237,787	2.467
16-17	96,285	96,383	.6905	66,485	154,337	1.602
17-18	96,208	96,321	.4997	48,075	87,852	0.913
18-19	96,124	96,248	.2725	26,194	39,777	0.414
19-20	96,034	96,168	.1005	9,651	13,583	0.141
20-21	95,937	96,988	.0264	2,533	3,932	0.041
21-22	95,834	95,887	.0146	1,399	1,399	0.015

*definitions of symbols are given in the Appendix.

for India compiled by Premi and Chandra. The methodology is similar in all three cases. One factor which detracts from the validity of the comparison is that the United States and Indian tables refer to persons enrolled in all educational institutions. Stockwell and Nam state that their enrolment figures refer to those in "regular" schools,

where a person may advance toward an elementary school certificate, high school diploma, or college or university degree. Persons attending other types of schools or courses are not regarded as enrolled unless credits are obtained which are transferable to a "regular" school. (Stockwell and Nam, 1963, p. 1114)

Premi and Chandra state that their figures cover "all types of education." (Premi and Chandra, 1968, p. 3.) The Canadian data in this paper refer to persons enrolled in elementary and secondary educational institutions. Nevertheless, comparisons of ages under 15 are justified since most of the United States and Indian school populations under 15 would be enrolled in elementary and secondary schools.

A second debilitating factor is the different smoothing methods involved in each of the three tables, a procedure which affects the derived values in the tables. Stockwell and Nam do not describe the methods they used. Premi and Chandra draw a free hand curve to smooth those ages beyond twenty. Assuming that all smoothing procedures attain the same result a comparison of the three school life tables for ages under 15 is viable.

Comparing the stationary school populations of the three countries,

we find the Canadian values are lower than United States values in each year while Indian values are lower than either except for the age 5-6 when the Canadian value is lower than that of India. The data reveal that Americans start their children in school at an earlier age than Indians or Canadians, that Indians rank second and that Canadians are most dilatory of the three countries in this regard.

TABLE 2

THE STATIONARY SCHOOL POPULATIONS OF CANADA, THE UNITED STATES AND INDIA

Age	Canada L_{sx}	United States L_{sx}	India L_{sx}
5-6	11,511	55,308	18,293
6-7	62,669	93,859	37,610
7-8	93,814	95,632	44,148
8-9	95,471	95,740	40,858
9-10	94,735	95,851	36,837
10-11	94,176	95,769	32,643
11-12	93,964	95,706	26,978
12-13	93,607	95,505	22,201
13-14	92,090	95,257	17,911
14-15	90,230	94,643	14,473

Indian participation rates fall rapidly behind those of the two North American countries for ages beyond 6 years, creating much lower values in the school life table. Canadian and United States values differ minimally from 8 to 10, but the American stationary school population is much larger than that of Canada before the age of 8. The stationary school population reaches its highest value in Canada in the interval 8-9, one year earlier than that of the United States. Attrition occurs more rapidly in Canada than in the United States suggesting that the school holding power is weaker in the former country. The difference in attrition rates is considerable and may have been created by differences in smoothing procedures or by the fact that the United States school population in these ages could have included some persons who were not attending elementary or secondary institutions.

Assuming that the differences in school life table values are a reflection of the school life patterns of the respective countries, we note in the preceding table a distinct difference in these patterns. Several possible factors that might explain the differences demand investigation. Such influences as compulsory school laws and propinquity of residence to school probably play a role in determining national school participation rates. Other factors might be the values attributed to education and the education cost/personal income ratio in the respective countries.

IV. Summary and Discussion

Educators have always expressed concern over the occurrence of school dropouts but they have never been provided with a standardized format for depicting the incidence of dropouts. In this paper the school life table method has been utilized because it meets the criterion of standardization, opening up possibilities for comparing the incidence of dropouts across time periods and across geographical areas.

Validating the data in this, as in most research, posed a problem. This problem is most apparent when one compiles life tables because all extraneous factors which create fluctuations in the data are removed. The remaining anomalies become starkly visible and are the effects of invalid data. Smoothing procedures were applied to school participation rates employed in the construction of the ensuing school life table and consequently they played a role in the portrayal of Canadian school life patterns. Consequently, a detailed description of these procedures is included in the appendix along with the general methodology employed in this paper, a methodology which replicates that used in the construction of school life tables drawn up by Stockwell and Nam for the United States and by Chandra and Premi for India. Endorsing equivalent methodologies facilitates international comparisons of school accessions and separations although the derived differences in national school life patterns are somewhat clouded by discrepancies in the definition of school participation. Nevertheless, striking differences between the three nations occurred at initial stages of school life. Canadian children began attending school later than both Indian and United States children. The incidence of school attendance by age in Canada quickly surpassed that of India but never achieved the same level as that of the United States while separations from Canadian schools occurred at a faster rate than from United States schools. Speculative explanations for such differences in school life patterns between Canada and the United States might involve the sparser population in Canada which necessitates a wider geographic distribution of schools. The different patterns may be a reflection of lower esteem for education, or of fewer economic incentives to prolong education in Canada.

The Canadian school population exists within twelve separate education systems, each with its own set of laws governing school attendance and each with its unique set of school life patterns. Construction of provincial school life tables would provide insights into regional differences within Canada and provincial tables for different periods of time would portray trends within these regions.

The work done in this paper was initiated by Dr. P. Krishnan of the Department of Sociology, University of Alberta. I have benefited from his many suggestions and criticisms.

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Appendix

The Appendix deals with the methodology used to compute the school life table. Table 1 depicts the table of school life for the total population in 1955-56 and 1960-61. It consists of conventional life table columns but with the values expressed in terms of school enrolment.

L_x — the stationary population, representing the number of persons alive during each age interval x to $x+1$ assuming 100,000 births of each age cohort and assuming exposure to 1960-62 age-specific mortality rates in Canada for $4 \leq x \leq 22$. The stationary population is the number alive at the end of the interval (l_{x+1}) added to the average number of years lived by those who died during the

interval. Since it is assumed that mortality rates are constant during the interval x to $x+1$, the stationary population would be derived by:

$$L_x = \frac{1}{2}(l_x + l_{x-1})$$

l_x — refers to the number of males and females who would be alive at exact age x if 100,000 live births were subjected to 1960-62 age-specific mortality rates throughout their lifetime. The values were obtained by assuming a sex ratio of 105 males to 100 females at birth and by applying the formula:

$$l_x = (1.05 l_x^m + l_x^f) / 2.05$$

to 1960-62 life table data by sex, where l_x is the population of males and females who are alive at exact age x and l_x^m and l_x^f are the number of males and females respectively who reach age x as listed in the 1960-62 Canadian Life Tables.

s_x — enrolment rates obtained by averaging 1955-56 and 1960-61 rates and smoothing the rates which correspond to ages 9-14. s_x values for ages 4 and 5 are obtained by a different procedure because enrolment rates increase so rapidly during these ages. A free hand logistic curve was fitted to estimated rates at ages 4.0, 5.0, 6.5 and 7.5. From the curve, rates for tenths of a year for ages 4.0 to 6.0 were estimated and weighted according to the length of school participation time they entailed, and weighted participation rates were derived for each one-year age group.

L_{sx} — the number of persons who attend school during each age interval x to $x+1$ under the assumption that 100,000 annual live births are exposed throughout their lifetime to the age-specific mortality rates of 1960-62 and to the school participation rates derived from 1955-56 and 1960-61 data. Values were obtained by multiplying the L_x values by the corresponding school participation rates (s_x) in each age interval:

$$L_{sx} = L_x s_x$$

For the age interval 4-5, L_{sx} was obtained by multiplying the L_x value from the life table by the weighted participation rates.

T_{sx} — represents the total number of years in elementary and secondary school remaining to all persons enrolled in school. It is obtained by cumulatively summing the L_{sx} values from the oldest age to the youngest:

$$T_{sx} = \sum_x L_{sx}$$

e_{sx} — the mean number of school years remaining to persons who are alive at exact age x . It is calculated by dividing T_{sx} by the number of persons alive at exact age x :

$$e_{sx} = \frac{T_{sx}}{l_x}$$

TABLE A
POPULATION AND ENROLMENT DATA IN CANADA, 1956, 1961, AND
1956-61 COMBINED

CANADIAN POPULATION CANADIAN ENROLMENT PARTICIPATION RATES									
Age	1956	1961	Total 1956 and 1961	1956	1961	Total 1956 and 1961	1956	1961	Total 1956 and 1961
4	369,341	432,356	801,697	580	897	1,477	.0015	.0020	.0018
5	386,066	428,586	814,652	54,770	85,305	140,075	.1418	.2011	.1719
6	375,544	423,294	798,838	226,627	290,801	517,428	.6034	.6869	.6477
7	362,977	416,490	779,467	346,106	410,105	756,211	.9535	.9846	.9701
8	348,845	409,419	758,264	351,620	397,380	749,000	1.0079	.9705	.9877
9	333,621	401,733	735,354	356,084	384,128	740,212	1.0673	.9561	1.0066
10	317,524	394,116	711,640	303,606	376,955	680,561	.9561	.9564	.9563
11	300,776	387,090	687,866	284,582	366,710	651,292	.9461	.9473	.9468
12	285,113	376,177	661,290	282,165	362,900	645,065	.9896	.9647	.9754
13	271,506	359,444	630,950	274,144	361,693	635,837	1.0097	1.0062	1.0077
14	259,675	339,172	598,847	244,813	356,027	600,840	.9427	1.0496	1.0033
15	248,153	319,756	567,909	208,944	282,939	491,883	.8419	.8848	.8661
16	236,960	300,501	537,461	151,340	219,778	371,118	.6386	.7313	.6905
17	228,784	283,357	512,141	100,136	155,814	255,950	.4376	.5498	.4997
18	224,722	269,811	494,533	52,286	82,503	134,789	.2326	.3057	.2725
19	223,682	259,134	482,816	21,156	27,381	48,537	.0945	.1056	.1005
20	223,210	248,756	471,966	4,897	7,585	12,482	.0219	.0304	.0264
21	223,496	238,734	462,230	3,563	3,197	6,760	.0159	.0133	.0146

Source: DBS, 1956 Census of Canada, Bul. 1-10, Table 21.

DBS, 1961 Census of Canada, Bul. 1.2-3, Table 26.

DBS, Survey of Elementary and Secondary Education, 1955-56, Cat. 81-401, Tables 5, 54.

DBS, Survey of Elementary and Secondary Education, 1960-61, Cat. 81-210, Table 1-03.

TABLE B
SCHOOL PARTICIPATION RATES AND LIFE TABLE VALUES FOR
CANADA, 1955-1961

Age	l_x Both Sexes 1960-62	Participation Rates 1955-61
0	100,000	
1	97,269	
2	97,100	
3	96,997	
4	96,915	.0018
5	96,845	.1719
6	96,784	.6477
7	96,730	.9701
8	96,682	.9877
9	96,639	.9805*
10	96,600	.9751**
11	96,561	.9733**
12	96,523	.9700**
13	96,482	.9547**
14	96,437	.9359*
15	96,383	.8661
16	96,321	.6905
17	96,248	.4997
18	96,168	.2725
19	96,082	.1005
20	95,988	.0264
21	95,887	.0146
22	95,782	
23	95,673	
24	95,564	

* smoothed once

** smoothed twice

Source: DBS Canadian Life Tables, 1960-62, Cat. 84-510.

TABLE C
PARTICIPATION RATIOS FOR $4.0 \leq \text{AGE} \leq 5.9$ ACCORDING TO FREE
HAND LOGISTIC CURVE

Age	s_x	Length of Year Spent in School	Weighted Average
4.0	0.00	10	
4.1	.00	9	
4.2	.00	8	
4.3	.00	7	
4.4	.00	6	
			.0025
4.5	.00	5	
4.6	.01	4	
4.7	.01	3	
4.8	.02	2	
4.9	.03	1	
5.0	.04	10	
5.1	.06	9	
5.2	.09	8	
5.3	.11	7	
5.4	.14	6	
			.1189
5.5	.17	5	
5.6	.20	4	
5.7	.24	3	
5.8	.28	2	
5.9	.34	1	

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Teacher Education: Environments and Outcome

Students' opinions about their college environments are related to objectively determined features of their academic community; also to the actual measured changes which take place in these students on three year courses, shown by examination results, attitude and personality changes, values of a personal, social and religious kind. A complete sample ($n = 1,247$) of the intake and output of ten Colleges of Education in a single Institute of Education provided the raw data. The two main predictors of change in students were found to be the college emphasis on science and the democratic or "open" structure of the college.

This study falls into three parts: first, the attempt is made to measure students' attitudes to college environments using a subjective scale; second, an attempt is made to devise an objective index based on an inventory, using factual information such as size of college, qualifications of staff, etc.; third, an attempt is made to relate measured changes in students (in variables such as academic ability, educational attitudes, practical teaching) to the conditions of their environment as measured by the two scales, subjective and objective. The data analyzed relate to ten Colleges of Education associated in a single Institute of Education area in England.

I. The Subjective Evaluation Scale

In developing a scale concerned with the nature and quality of college environments, considerations of validity and reliability figure prominently. Preliminary inquiries about the validity of a rating scale method revealed that students appear to be incapable of using this method to characterize their environment (McLeish, 1969).

It seems to be a counsel of practical wisdom to begin where other research workers have left off. This meant collating existing measures and reports on college environments, amending scales already available for the purpose of developing one appropriate to the special circumstances of the colleges being investigated.

The *College Characteristics Index* (Pace and Stern, 1958) was used as a source of statements which could be suitably modified and reorganized to serve as a test-instrument. From various sources, including Pace and Stern, 100 favorable statements were written down descriptive of aspects of college environments. These were classified under ten general headings. Thus, for each of the ten dimensions, ten statements were available, every tenth statement referring to a particular dimension. Students are invited to agree or disagree with each of ten statements, using a standard record form. The total score on the environment index, obtained by counting the number of items with which students agree, provides a measure of the student's view of the total environment; the average score measures the attitude of the student group to a particular college environment. The scores on each of the ten dimensions provide a detailed picture of each college as perceived by the students.

After an item-analysis of the students' responses, and having discussed the scale in relation to their college with members of staff, the names of the dimensions were settled upon. These provide a description of what each group of statements purports to measure. The dimensions are named as follows:

1. Student Energy; 2. Concern for Individuality; 3. Social Commitment; 4. Staff Image; 5. Intellectual Climate; 6. Clarity and System; 7. Student Loyalty to College; 8. Humane Regulations; 9. Group Participation; 10. Lack of Tension. Full details, including the scale itself, are presented elsewhere (McLeish, 1970).

In constructing the scale only favorable statements were used, except for Dimension 10. This unidirectionality seems likely to produce a response "set" favorable to the colleges. But since the purpose was to compare the ten college environments and not to define them in an absolute sense, it was decided to proceed on the basis that *either* the response "set" would act in the same direction and be equally favorable to each college, *or* it would have the effect of spreading the average scores over a wider range without affecting the rank order. To test the possibility that students might simply accept the statements on the basis of response "set," a kind of "lie scale" was devised by reversing the direction of statements in the tenth dimension ("tension"). On analysis, it was found that students who accepted a great number of favorable statements also agreed with statements in the tenth dimension intended to be unfavorable. The reverse is also true. The hypothesis about "set" was thus verified.

II. The Comparison of College Environments

The scale was completed by two complete samples, consisting of 1,247 three-year students in ten colleges and 229 two-year "mature" students in the six of these colleges which accepted this kind of student, in the last term of their respective courses. The testing of the mature students was conducted as a "trial run," a year in advance of testing the main sample, to validate the instrument. It was of considerable interest to discover that about a quarter of the statements discriminated between the colleges. The rationale underlying the scoring scheme is that if two-thirds or more of the student body agree that a particular statement is true

or false about their college, it is probable that this consensus reflects the objective reality. If the agreement is less than two-thirds, the nearer it approximates to a 50-50 split, the greater is the probability that students are reacting on a random basis. In such a case, the responses are disregarded as being not relevant to that particular college. In other words, it is impossible to say whether the students do not know the facts, or whether their disagreement is a simple difference of opinion. In either event, the students' view, reflected in the average score given that statement, is considered to be non-evidential with reference to that particular college.

In view of the gratifying results of the trial run with the mature students, it was decided to use the scale in its original form. It was expected that the younger resident students, for whom the scale was originally designed, would experience little difficulty with any of the statements. This prediction was verified on testing exactly a year later.

The sample of 1,247 three-year students is considered to be the definitive sample of student opinion about the ten colleges. They had spent one, two or three years in residence; they had been in close touch with all the other year groups passing through at the same time as themselves; they were fully involved in college activities. These statements are not true of the mature students. On testing, the main sample had almost completed their courses, after three years of full-time study. It seemed they had nothing to lose by answering the questionnaire frankly. They were assured of the complete confidentiality of their replies, that the main object of the investigation was to delineate the realities of college life, and that the investigator's main interest was to discover how the quality of college life might be improved. The students understood from previous testing that completed scales were taken direct from the colleges and scored by research workers who were not concerned with them as individuals, and who had no particular association with any of the colleges.

The results of this testing operation indicated that the instrument really does discriminate—average scores for the different colleges range from 49 to 20, with a spread such that each college can be differentiated clearly from the others. A detailed analysis of the colleges and of the index is given in another place (McLeish, 1970). This paper will concentrate on providing further data to show the relation between these measures and "output" criteria in the form of changes produced in students during their college life.

If we intercorrelate scores on the ten dimensions ($n=1247$), all the correlations are positive, with the exception of the tenth dimension (lack of anxiety). Here the correlations are uniformly negative. (It should be remembered that this dimension is scored in a reverse direction to the other nine). This is true of every college separately, and of the colleges thrown together in one group. If we reverse the correlations on the tenth dimension, thus scoring all items in the same direction (favorable to the college), the intercorrelations can be accounted for in terms of two factors. The first of these arranges the ten dimensions in the order shown (Table 1).

This is clearly a general factor of *approval*. It accounts for 45 percent of the total variance. It tells us that the general excellence of a college

TABLE 1
FACTOR SATURATIONS OF THE COLLEGE ENVIRONMENT INDEX

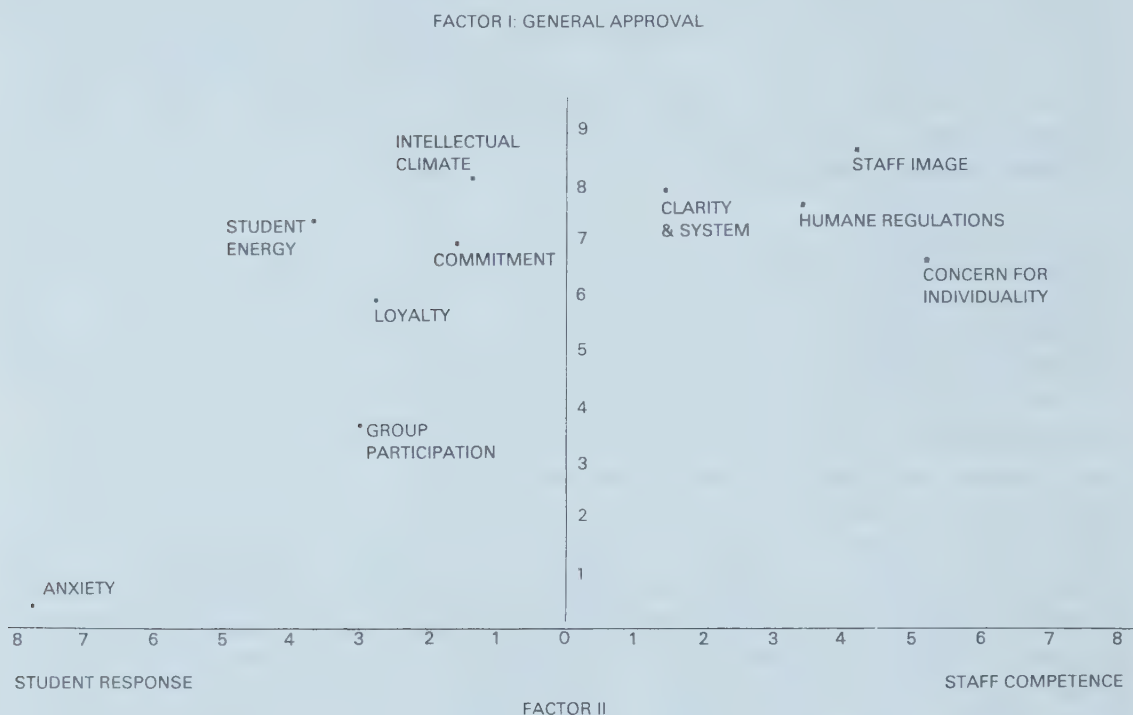
Dimension	Saturation Coefficients	
	First Factor	Second Factor
4. Staff Image	.77	.44
5. Concern for Individuality	.75	.54
6. Clarity and System	.74	.15
1. Student Energy	.74	-.30
8. Intellectual Climate	.72	-.12
3. Social Commitment	.71	-.17
2. Humane Regulations	.70	.36
7. Loyalty to College	.67	-.28
9. Group Participation	.46	-.30
10. Anxiety Level	.14	-.75

environment is seen from the student viewpoint as a function of a concerned and objective faculty, the concern for individuality shown by the college authorities, the clarity and systematic procedures with which courses are taught. Students also place considerable emphasis on the liveliness of the student body and the intellectual climate of the college. The concern of the staff with outside affairs (social commitment) and the loyalty of students to the institution come slightly lower down in the scale of priorities, but these features still function at a high level in the general pattern of approval. Group participation appears to be less important and the amount of anxiety generated by examinations as well as concern about career prospects appear to be quite unimportant, either positively or negatively.

On removing the influence of the first factor, the residual correlations yield a second, bipolar factor. This contrasts the ten dimensions in two groups. Intellectual climate, loyalty to college, social commitment, group participation, student energy, and anxiety are at one pole, whilst clarity-system, humane regulations, staff image and concern for individuality are at the other. This factor accounts for about 13 per cent of the total variance. It appears to contrast two kinds of environment: one end is characterized by the competence and humanity of the college staff, the other emphasizes effective student response to the environment. These relationships are set out diagrammatically in Figure 1.

Repeating the analysis, adding other variables consisting of the students' attitudes to the three teaching methods (lecture, tutorial and seminar) together with the thirty variables of the *Cambridge Survey of Educational Opinions* (McLeish, 1970), we discover several interesting clusters of variables. The ten dimensions of the College Environment Index are closely associated with each other in the first principal component. The general approval factor is now seen to be closely related to a stable conservatism in the student body: disapproval is associated with instability and radicalism. This dimension picks up also a tender-minded religious orienta-

FIGURE 1
The Inter-relations of the Ten Dimensions
of the College Environment Index



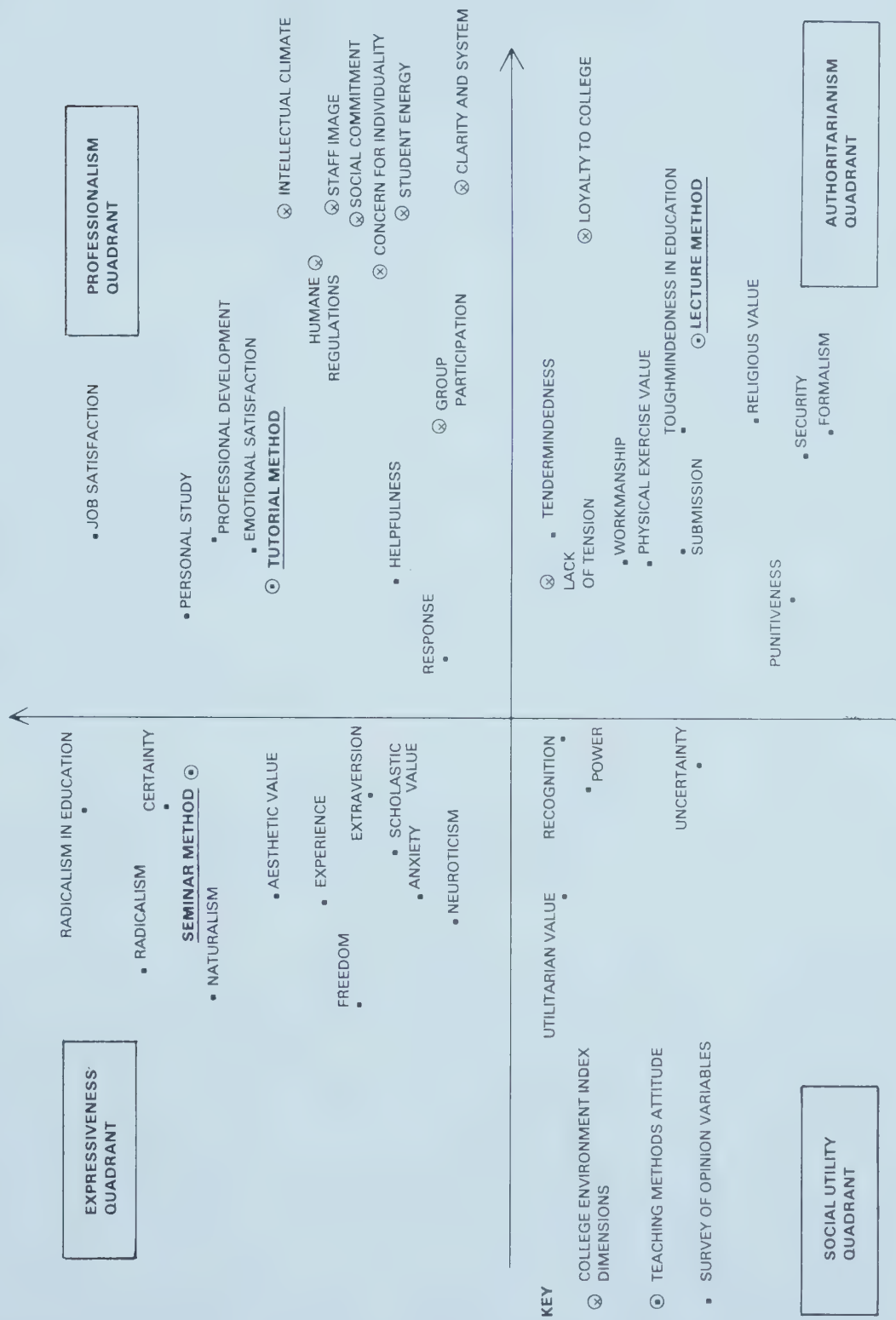
tion which seems to be associated with a favorable attitude to professional development, to the lecture method, and to teaching as a career. The first factor now accounts for only 12 per cent of the total variance most of this being accounted for by the *College Environment Index*. (Figure 2.)

The second factor, which now accounts for about 9 per cent of the remaining variance, is clearly associated with a radicalism which goes with a favorable attitude to the seminar and tutorial. The two factors separate out: (i) a traditional, conservative, religious outlook favorable to the college, this being in contrast to a radical, naturalistic humanism which tends to be negative, even destructive in relation to teaching as a career and to the college provision; and (ii) a more discriminating radicalism which singles out particular aspects of the college environment as praiseworthy, which is committed to professional standards, and to teaching as a career.

In relation to these factors, it should be remembered that students as a group are not impressed by *any* of the colleges. In the best case, they accept only 49 per cent of the favorable statements as applicable to their environment; in the worst case only 20 per cent (McLeish, 1970).

Accepting that factors are best interpreted as principles of classification (Sir Cyril Burt has developed this idea at some length), these two orthogonal factors generate four quadrants, or pigeon-holes, within which the ten dimensions of the *College Environment Index* are disposed, along with the thirty-three other variables. In fact, the analysis shows that nine of the ten dimensions of the *Index* form a cluster within the same quadrant. Here too are located four variables related to satisfaction with teaching

FIGURE 2
Plot of College Environment Index with other Attitudinal and Personality Measures



as a career, two concerned with helpfulness and response to people, and another variable having to do with satisfaction with the tutorial method used in college teaching.

The *College Environment Index* variables, the values and attitudes of students and the measures of attitude to lecture, seminar and tutorial methods, judging by the way they group in the four quadrants, separate out four basic responses in teacher education—(a) a professional approach which catches up most of the favourable “sets” towards the college environment, (b) an expressiveness, or self-actualization approach which is associated with an unfavourable attitude towards teaching and teacher education, (c) an authoritarian, religious orientation favourable to the college environment and to the education provided, and (d) a set of attitudes and needs based on the criterion of social utility, these tending to be unfavourable towards the education and the environment provided.

III. The Objective Evaluation Scale

Although it is assumed that a consensus of two-thirds, or more, of the student body should point to some kind of reality, it is clear that a more objective measure is needed. A considerable amount of detailed factual information was available about each of the colleges. This was in the form of returns about the numbers and the training of staff, the numbers of students, and types of courses, etc. These returns were submitted periodically by each college to the Department of Education and Science. Pass lists for the final examinations (set by the Institute) were also available, as well as other materials. These factual data can be used to develop meaningful, quantitative indices which are obviously related to various aspects of the college environment. Twenty-three statistical indices were constructed to categorize the different colleges, using standard procedures (McLeish, 1970). The indices can be classified in four groups as follows:

1. Data relating to size of the College

Under this heading, five indices are available: number of students, of staff, rate of growth of the college, nature of the physical environment, the facility with which communication can be effected within the college system.

2. Data relating to character of the College

Here are several indices: the proportion of mature students; likewise the proportion of male students; the index of “masculinity,” being a measure based on the sex of the college principal and vice-principal, the proportion of male staff and of male students; “maturity,” based on the percentage of students over the age of twenty-five accepted for shortened two-year courses or for one year post-graduate courses; the index “community,” which seeks to answer the question: “How readily does the physical layout of the college lend itself to the development of an academic community?” and takes account of such things as proximity to a university or similar cultural centre, nearness to the metropolis, a reasonable layout of the college as an institution of higher learning; academic status which is determined from the pass lists processed by adding the passes, credits and distinctions which students obtained in the four parts of their final examina-

tion; library facilities, an index which takes into consideration the number, and the range, of books and periodicals in the college library; secular emphasis which was assessed in terms of the college emphasis on a narrow, fundamentalist religion, this being considered to be a handicap in an institution of higher learning. The staff-student ratio provides a measure of another important aspect of the college environment.

3. Data relating to Staff Qualifications

The professional qualifications of the staff were assessed in several ways. The main function of a college of education was taken to be the provision of a soundly based academic curriculum, with adequate and appropriate arrangements for the practical training of student teachers for the classroom. Staff scholarship is another variable in this group. It is distinguished from staff preparation, this consisting of the amount of practical training the lecturers themselves had experienced. Staff scholarship refers to academic training, it is calculated from the number on the faculty with graduate status and with advanced degrees. The staff training index was constructed on the basis of the proportion which had undergone teacher training, or taken advanced courses, or with a master's degree in education or some higher qualification in the area of teacher education. As a separate index the proportion completing an advanced full-time Institute course, or taking a master's degree in education in addition to their initial teacher training, was calculated. The ratio of untrained staff, as a percentage of total, provided still another index. In this case the scale was reversed, since a relatively large proportion of untrained staff was regarded as a disadvantage. Finally, under this main heading, a total impressionistic summary of "staff quality" was provided by the experimenter. In most of these cases a five-point scale was used.

4. Data relating to Courses

The nature of the courses provided constituted a fourth group of indices of significance in relation to an institution devoted to the initial training and education of teachers. The nature and diversity of courses constitute the basic data from which this index was constructed. In these colleges, courses fall in general into two groups: *academic* courses which are provided for personal development; and *professional* courses which provide for practical training. The latter are based on the notion of giving essential orientation to classroom activities whilst leaving students sufficient flexibility to adapt to the new and developing schools of tomorrow.

Indices were constructed as follows: the spread of courses dealing with teaching methods in the school subjects was assessed on a five-point scale; the main subject provided an index which summarized the extent to which colleges provided a spread of liberal studies in contrast to useful arts, crafts or practical training. The percentage of students in each college registered for the Bachelor of Education degree was used as an index of the diversification of courses. Similarly, the number of levels of training in terms of the age ranges of the children to be taught, was used as another index of diversification. Finally, the percentage of students studying for the advanced main paper in any subject provided another index of the quality of the college environment. The subjects

range through mathematics, the humanities, environmental studies, arts and crafts and advanced needlework.

The twenty-three basic indices were calculated on the same general plan. The colleges were assessed on a five-point scale according to the relationship each had to every other college on the index in question. It was assumed that on each index, *four* colleges could be given an average grade, *two* could be regarded as being above average, another *two* as below average; lastly, *one* college could be regarded as outstandingly above, and one other as outstandingly below average. No difficulty was experienced in transforming the numerical and other data into this five-point scale, the lines of division being quite sharp at the cutting-points.

One of the many advantages of this standardization technique is that it is possible very quickly to characterize the basic differences and similarities in the colleges. It is the object of the present study to discover, by appropriate analysis, these similarities and differences.

The impression derived from these indices is that in this group of colleges, one is outstandingly successful in developing an academic community dedicated to high scholastic and professional standards. At the other end of the scale we find a college where the history and situation, as well as the physical difficulties imposed by the site, militate against this kind of development. Between these two extremes we have a range of environments which differ in specific ways.

Covariance analysis can be used to discover the relationship between the colleges. There seems to be a hierarchical organization within the college group in terms of the quality of their environments. The best environment appears to be twice as good as the worst.

Comparing the two sets of indices (subjective and objective) it is possible to say whether, and to what extent the students' view of the environment is wholly subjective, without much relationship to those objective features which, it is generally assumed, predetermine the academic and humane quality of the environment (McLeish, 1970, pp. 103-109). Generally speaking, the students' impressions concur with the objective index.

IV. The Relationship Between Environment and Outcome

Data for each of the ten colleges on some sixty variables related to environment, plus fourteen variables related to educational product, were available. The first step consists of classification, with a view to reducing the number of variables. From scrutiny of the environmental variables it appeared that they could be placed in five categories, each of which singles out one aspect of the environment. These groups of variables were submitted to factor analysis separately to obtain *representative* variables, in the form of factors, for each category.

A. Environmental Factors: Objective Indices

Since factor scores were desired, the number of variables in each category was held to a maximum of nine, one less than the number of colleges. Excess variables were discarded according to two rules: (1) the variable correlated very highly with some other in the group; or (2) the

variable appeared to offer little promise of discriminating between the colleges. For example, whether or not provision was made by the college for the training of nursery teachers was discarded since only one college offered such training. This variable could therefore not be a basis for discriminating between the other nine colleges. Similarly, the number of students living at home was omitted since it correlated very highly (0.96) with the number of students on shortened courses. Likewise, the number of factors extracted from each group of variables was restricted to two in the interests of simplifying the analysis.

TABLE 2
Environmental Characteristics—Nature of Student Body

Variable	Factors		Communality
	I	II	
1. # of students (total)	<u>.717</u>	-.129	.531
2. % of male students (3 yr. program)	<u>.668</u>	.085	.453
3. % male students (2 yr. program)	<u>.894</u>	.240	.857
4. # of students (2 yr. program)	<u>.947</u>	.159	.921
5. % students in residence	<u>.04</u>	-.243	.876
6. % students in approved lodgings	-.394	-.370	.292
7. % students in infant training	-.203	<u>.671</u>	.492
8. % students in infant-secondary	.361	<u>.771</u>	.725
9. % students in secondary training	-.218	-. <u>.942</u>	.934

On the basis of the relationships revealed by the Varimax rotations (see Tables 2 to 6), key environmental factors were identified. First of all, the colleges can be discriminated in terms of their student populations, the two factors in question being interpreted as “Coeducational-Student Maturity” and “Intended Teaching Level” (Factors I and II, Table 2).

The staff characteristics can be summarized most economically in terms of the factor identified as “Professional or classroom orientation versus

TABLE 3
Environmental Characteristics—Staff Variables

Variable	Factors		Communality
	I	II	
1. % graduate staff (full time)	-.313	<u>.596</u>	.454
2. % with teacher training (full time)	<u>.818</u>	.087	.677
3. % with advanced diploma (full time)	.303	.359	.221
4. # of full time staff	.385	<u>.531</u>	.431
5. Ratio part-time to full-time	-. <u>.483</u>	.252	.297
6. % untrained grads (full time)	-.933	.002	.871
7. % untrained, no degree (full time)	-. <u>.609</u>	-.025	.371
8. % male staff (full time)	-.158	<u>.941</u>	.911
9. Sex of principal (male)	.033	<u>.604</u>	.366

Personal (academic) development." The second factor is one of "Staff Masculinity" (Table 3).

The student evaluations of their college environments (Table 4) yields factors which can be labelled "General Quality of the Environment" and "Democratic or Open Structure," respectively.

TABLE 4
Environmental Characteristics—Student Evaluations

Variable	Factors		Communality
	I	II	
1. Facility of communication	-.159	.850	.747
2. Student energy	.883	.068	.785
3. Concern for individuality	.281	.828	.764
4. Social commitment	.798	-.092	.645
5. Staff image	.393	.865	.903
6. Intellectual Climate	.741	.458	.758
7. Clarity and system in courses	.759	.474	.802
8. Loyalty to college	.855	-.124	.746
9. Freedom from anxiety	-.148	.911	.853

The classification of students in terms of courses provides the two factors "Technical Sciences versus Humane Studies" and an "Academic versus Applied Emphasis" dimension (Table 5).

The last pair of factors (Table 6) catches up variables which are associated with the institutional features of the colleges. They can be appropriately labelled "Institutional Maturity" and "Institutional Utility" factors. The first of these factors contrasts the older, smaller foundations with more recent, rapidly expanding, more practically oriented colleges. The factor "Institutional Utility" implies that the college exists to meet a strong demand from the external environment. Such colleges are distinguished by having a large student body, they show a high rate of growth, they are relatively distant from a university, and are financed and supported by

TABLE 5
Environmental Characteristics—Students' Academic Programs

Variable	Factors		Communality
	I	II	
1. % studying humanities	-.888	.136	.808
2. % studying maths and sciences	.639	.654	.836
3. % studying environmental studies	.572	-.376	.469
4. % studying arts, crafts and music	.173	-.459	.240
5. % studying practical subjects	.938	-.219	.927
6. % taking advanced main subjects	-.238	.910	.885
7. % taking B.Ed. program	-.207	.860	.782
8. % studying divinity	-.543	.423	.473

a local educational authority. Although they tend to have a good library, their ratings on professional courses, and their evaluation by students is low.

TABLE 6
Environmental Characteristics—General Institution Features

Variable	Factors		Communality
	I	II	
1. L.E.A. or religious affiliation	<u>.626</u>	-.302	.482
2. square root of # of students	.002	<u>.810</u>	.655
3. character of library*	<u>.542</u>	<u>.806</u>	.944
4. rating of professional courses*	.189	-.582	.374
5. rate of growth (enrollment)	-.350	<u>.554</u>	.430
6. quality of physical environment*	<u>.897</u>	-.081	.812
7. rating of community life*	<u>.961</u>	.054	.926
8. total of student evaluation	<u>.616</u>	-.409	.547
9. distance from university	-.399	<u>.830</u>	.848

* These were rated on a five-point scale, with zero as the mid-point.

B. Product Factors: College Profiles

Having obtained scores for each of the colleges on each of these ten factors, attention was now focused on the fourteen product variables. These are: examination results, radicalism, punitiveness, formalism, naturalism in education, radicalism in education, religious value, utilitarian value, emotional, personal, professional and general satisfaction derived from teaching, tough-mindedness in education, anxiety, total change scores (pre-test to post-test) and the weighted score for change towards secular radicalism. (For a detailed description of variables and tests, see McLeish, 1970.) As a preliminary to factor analysis the scores on each of the product variables were standardized to a mean of fifty and a standard deviation of ten. Additionally, scores on those variables which had *negative* correlations with the total change score were reversed. The purpose of this analysis was to discover, if possible, colleges with similar product profiles. Analysis of the factor scores (Table 7) indicates that the colleges cluster in four groups. (College names are fictitious to conceal their identities: saturations which are underlined are taken to be significant.)

In each group, the classification is bipolar, certain colleges in each group being opposite in character to the others. In the first group, Mantague and Underwood are counterposed to Hathaway and Torridon. The profiles reveal that the colleges so grouped owe their similarities and differences to the dimensions Technical Sciences, Intended Teaching Level, Institutional Maturity, and Teacher Training. The second group, which includes Blandon and Pemberton, consists of polar opposites in respect of the Coeducational-Student Maturity, Intended Teaching Level and Technical Sciences dimensions. The third group, which includes Brookhurst

and Stanfield, are in contrast on *all* the environmental variables except for the Institutional Maturity dimension. Probably the most interesting finding is with respect to Group IV colleges in which Langley is opposed to Clarendon. One of the colleges has an environment which fluctuates at the extremes on the various environmental dimensions, being very high in some and very low in other measures, whereas the other college is consistently low on all ten environmental scales. That these two colleges should have similar educational outcomes is explained by an observation made by Pace and Stern to the effect that, as far as outcomes are concerned, it is about equally ineffective to have an environment which manifests incongruencies between the objectives and the demands made on the student, as to have one that is uniformly bad. Thus it is to be expected that an inconsistent environment (Pace and Stern's implicit press in conflict with explicit objectives) would have approximately the same effect on outcome variables as a relatively poor environment.

TABLE 7
Factor Analysis: Colleges Grouped by Factors

College	Group I	Group II	Group III	Group IV	Commun- ality
1. Blandon	.119	<u>.935</u>	.120	.096	.913
2. Brookhurst	-.041	-.156	<u>.950</u>	.017	.929
3. Clarendon	-.264	.034	.110	<u>-.939</u>	.964
4. Hathaway	<u>-.769</u>	.342	.061	<u>-.452</u>	.917
5. Langley	-.499	-.379	.386	<u>.609</u>	.913
6. Montague	<u>.871</u>	.022	-.144	.097	.789
7. Pemberton	.178	<u>-.806</u>	.039	.344	.801
8. Stanfield	.556	-.124	<u>-.622</u>	.027	.712
9. Torridon	<u>-.683</u>	.248	-.566	.246	.909
10. Underwood	<u>.649</u>	.122	-.052	.058	.443

To elucidate the relationship between environment and product, a final analysis was carried out on the transpose of the college-by-product matrix to identify characteristic dimensions of change. The matrix of correlations of the fourteen product variables was subjected to an hierarchical factor analytic procedure suggested by Henrickson and White (1966). In this way it was hoped to determine the relationship between each of the variables and the general change factor. Certain redundant variables were eliminated from this analysis at the outset. For example, the variables Utilitarian Value and Job Satisfaction were discarded because of their very low communality with the general change factor, only 0.025 and 0.101 respectively. Since Formalism correlated very highly (negatively) with Naturalism in Education, it too was dropped from further analyses. The scores for Total Change and Weighted Score for Change were also discarded, since these were linear combinations of other variables and hence redundant. In this way it was possible to limit the number of variables in the analyses to nine, as before. The varimax factor matrix from these nine

variables, together with loadings on the general change factor are shown in Table 8.

TABLE 8
Product Characteristics: Varimax Rotation

Variable	Factors				Communality
	I	II	III	IV	
1. Examination Result	-.076	.272	.831	.602	.771
2. Anxiety level (decrease)	.358	.746	.135	.705	.702
3. Radicalism (increase)	.670	-.131	.654	.700	.894
4. Punitiveness (decrease)	.007	.837	.055	.507	.704
5. Naturalism/Ed. (increase)	.664	.720	-.046	.749	.935
6. Radicalism/Ed. (increase)	-.138	.554	.504	.530	.580
7. Religious value (decrease)	.920	.070	-.038	.547	.853
8. Emotional Satisfaction (decrease)	.278	-.020	.668	.546	.524
9. Tough-mindedness/Ed. (decrease)	.781	.283	.264	.766	.760

Descriptive labels for these factors are "Radical Social Humanism," "Educational Permissiveness," "Academic Interest." The fourth or general factor is the general outcome, or total measured effect of the colleges on students' attitudes. Factor scores for each of the colleges on these four outcome measures are given in Table 9.

TABLE 9
College Environments: Product Outcome Measures

College	"Radical Humanism"	"Educational Permissiveness"	"Academic Interest"	"General Outcome"	Total Sum (unweighted)
Blandon	54.1*M	55.5 M	64.5 H	63.8 H	237.9
Brookhurst	55.9 M	56.9 M	51.1 M	57.9 H	221.8
Clarendon	30.1 L	59.3 H	53.7 M	45.9 M	189.0
Hathaway	41.4 L	60.9 H	50.9 M	51.9 M	205.2
Langley	63.7 H	58.4 H	31.8 L	51.9 M	205.8
Montague	58.0 H	44.3 L	63.1 H	59.4 H	224.8
Pemberton	59.8 H	52.4 M	48.2 M	55.9 M	216.3
Stanfield	41.3 L	33.2 L	38.0 L	28.4 L	140.9
Torridon	43.3 M	46.9 M	41.4 L	39.2 L	170.8
Underwood	52.4 M	32.2 L	57.2 H	45.7 M	187.5

* H = relatively high; M = moderate; L = relatively low

Stepwise multiple regression (Draper & Smith, 1966), was used to determine which of the environmental dimensions could be related to each of the product dimensions. A probability level of 0.10 was found to be needed to identify a minimal number of predictors in this analysis. This suggests that the generalizability of the results is probably low: the

analyses should be viewed as exploratory (cf. McNemar, 1962, pp. 184-185). The correlation matrix shown in Table 10 provides an interesting series of hypotheses about the inter-relationships between outcomes and the nature of the college environment. It would appear that radical humanism is associated more or less closely with training for elementary schools in colleges where emphasis is placed more on personal development than on professional preparation, where there is an emphasis on humane studies rather than on scientific subjects and where there is a strong academic tradition and a large proportion of male staff (multiple correlation 0.73). Educational permissiveness seems to be a function of the system in general, all ten colleges producing this effect (this appearing as the most important single common objective in this group of colleges). It seems to be generated more efficiently where there is a co-educational student body, with a goodly proportion of mature students, in the relative absence of a professional orientation on the part of staff, which contains a relatively high proportion of males, and in the absence of an established academic tradition. Scholarship, or academic interest, appears as an outcome especially in relation to a democratic climate, coupled with an emphasis on academic versus applied courses (multiple correlation 0.62). This is true also of the general outcome measure which, of course, is heavily weighted towards humanism and a child-centered ideology.

TABLE 10
Environment x Product Correlations

Environment Dimensions	Product Dimensions			
	"Radical Humanism"	"Educational Permissiveness"	"Academic Interest"	"General Outcome"
1. Coeducational- Student Maturity	-.09	.34	.18	.25
2. Intended Teaching Level	-.55	.26	.24	-.03
3. Professional Orientation	-.48	-.30	.29	-.27
4. Staff Masculinity	.51	.10	.16	.45
5. Environment Quality	-.26	.34	.24	.19
6. Democratic Structure	.61	-.19	.59	.59
7. Technical Sciences	-.73	.30	.37	-.04
8. Academic Emphasis	.32	-.01	.56	.52
9. Institutional Maturity	.50	-.36	.39	.31
10. Institutional Utility	.11	-.04	.29	.21

Most of the conclusions to be drawn from the analyses have now been stated. Possibly the one which most needs to be reiterated is that

the results do not readily lend themselves to generalization beyond the data at hand. They should, however, facilitate the testing of suitable hypotheses using greater numbers of colleges. Alternatively, larger samples could be obtained by dividing particular colleges into smaller sub-cultures—especially in colleges which are large and diversified in the programs they offer.

The author wishes to thank Dan Precht for assistance with the computer analysis of the data and with the first draft of Part IV of this paper. Margaret Knight assisted in collecting, coding and analysing the data in the early stages of this inquiry. The University of Alberta provided funds and facilities for the computer analyses. The main study was carried out during the author's tenure as Research Fellow at the Cambridge Institute of Education.

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REFERENCE BOOKS RECEIVED

INVENTORY OF CURRENT RESEARCH ON POST-SECONDARY EDUCATION, 1972

by Lon Hefferlin, Melvin Bloom, Jerry Gaff, Brenda Longacre
Center for Research and Development in Higher Education, University of California, Berkeley, 1972 xii + 291 (no price quoted)

Eleven hundred projects are listed by name of the research worker with a brief outline of objectives, institutions involved and materials already published. A comprehensive index provides guidance by cross-references to other projects on related topics. Coverage is confined to North America. The result is a useful and tastefully produced resource which will prove valuable to all research workers in this area.

PSYCHOLOGY IN THE U.S.S.R.: AN HISTORICAL PERSPECTIVE

by Josef Brožek and Dan Slobin
International Arts and Sciences Press 1972, x + 301 (no price quoted)

A collection of reprinted articles from Soviet sources with linking editorial matter provides a useful guide to sources of information in English and Russian. Topics discussed include learning, development, higher nervous activity, aviation and space psychology, military psychology, sex, history from 1917, as well as accounts of where and by whom research is being conducted. The approach is encyclopedic with the virtue of comprehensiveness, and the associated defect of fragmentation. Emphasis on basic theory tends to be minimal, otherwise the editors have succeeded in their self-imposed task—to provide a working tool for those interested in obtaining access to Soviet work in a particular research area. The book should also interest those who need a picture of the general state of Soviet psychology and its special problems, theories and methodology.

THE TEACHER'S HANDBOOK

by Dwight W. Allen and Eli Siefman (eds.)
Scott, Foresman & Co., Glenview, Ill., xviii + 832, \$14.90

Eighty-seven leading American authorities contribute seventy-five articles on all aspects of the educational (teaching-learning) process. A comprehensive review of current American thought is presented for the beginning, and the experienced, teacher. The attempt is made to develop the concept of education based on some understanding of the perennial philosophical problems as well as the teacher's role in the developing and complex situations which confront us in the schools today. Annotated bibliographies accompany each article. The result is a pleasing and useful book which can be highly recommended for all those involved in teacher education.

CONTEMPORARY PROBLEMS IN HIGHER EDUCATION

by H. J. Butcher and Ernest Rudd (eds.)

McGraw-Hill Company, (U.K.), Maidenhead, England vi + 401, 7.20 (\$18.00).

Thirty authors review research and thinking about higher education in Britain over the past decade. The emphasis is on empirical research, most of which has appeared in British journals, or books, which are often relatively inaccessible. Inevitably, coverage is very uneven and topics discussed tend to lack coherence. The picture which emerges is of rapid growth in higher education and in research carried out piece-meal, motivated by the search for viable, if temporary solutions to administrative difficulties centering around inadequate financing, great growth in student numbers followed by a dropping-off, problems of student housing, unrest and disaffection amongst both students and faculty, problems of teaching method and student performance, as well as many others. The mixture is all too familiar and seems to be becoming more so in North America. The authors and editors are all actively associated with the (British) Society for Research into Higher Education.

DIRECTORY OF FACILITIES FOR THE LEARNING DISABLED AND HANDICAPPED

By Careth Ellingson and James Cass

My first reaction on examining this Directory was one of regret that so few Canadian facilities are listed. Whether or not this lack reflects a paucity of services for Canadian children with various handicapping disabilities should be the subject of investigation. One would suspect that many such services exist but are not included in this book.

The Directory covers "... diagnostic facilities and remedial therapeutic and developmental programs" for children with educational handicaps, speech and language disorders, physical disabilities, emotional disturbance and mental retardation. It is indexed according to states in the United States, provinces in Canada. The authors state that they obtained information from those facilities which were willing to provide data about their services. Each is then described according to the following criteria:

Diagnostic procedures; availability of specialists as consultants; remedial developmental and therapy programs; parent counselling.

Funding sources are listed, as is the availability of the organization for training purposes.

In general, information included in the Directory about each institution appears to be relatively comprehensive. Only five Canadian provinces are listed as having facilities for the handicapped child: British Columbia, Quebec, Manitoba, Ontario, and Prince Edward Island. Alberta is not included. This omission leads one to question the usefulness of the Directory to Canadians interested in learning about services available in their own country. One wished, perhaps unfairly, that the authors had been somewhat more aggressive in their search for missing information. Notable U.S. facilities are also missing in some cases: however in view of the fact that submission of information was voluntary, this is perhaps understandable.

The Directory is certainly an interesting document, and its authors are to be commended for undertaking a massive task. It may well be a valuable first step in compiling a more complete index of services in the future.

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FACULTY OF EDUCATION
The University of Alberta

KENNETH H. RUBIN

and

MARY C. TIERNEY

University of Windsor, Ontario

Students' Self-Selection of Examination Dates: A Preliminary Investigation

Undergraduate students enrolled in a Developmental Psychology course were given the opportunity to take the final semester examination on one of four dates. Students were responsible for all course content irrespective of the date they chose to write the exam. Significant positive interrelationships were discovered between the students' previous overall average, their choice of exam dates, and their examination grades. Significant mean differences between exam scores revealed that the earlier the test was written, the higher the grade attained. The data tentatively suggest that university residential requirements should be made to vary with the academic abilities of the students.

Universities have long required that a specific residential period of time must pass before a student is awarded an undergraduate degree. As a result, academicians have become all too familiar with the labels "Freshman", "Sophomore", "Junior", and "Senior" (or, in the case of universities within the province of Ontario, years I, II, and III). The lock-step approach to education that is typically found in today's universities may be providing the average student with a favorable learning environment. However, many university students are not "average" with regard to such educationally relevant variables as achievement motivation (McClelland, 1961) level of aspiration (Harrison, 1969), test anxiety (Kestenbaum & Weiner, 1970), and general academic ability. Unfortunately, the existent university system seems to have neglected these latter students who vary from the average on one or more of the above traits.

Perhaps one way in which universities can better serve all students would be to adopt a "self-paced" studies format. Such a format would be aimed at meeting individual variations in ability and speed of learning, level of aspiration, and other educationally relevant behaviors and motives. One manner in which the feasibility of such a program may be tested would

be to allow students to make their own selections of their final examination dates. By so doing, students could make personal decisions regarding the fulfillment of academic requirements.

Thus, the purpose of this study was to examine the effects of students' self-selection of examination dates on their subsequent academic performance. Two hypotheses were tested. First, it was postulated that students who had done well in the past, relative to other students in the class, would choose to take the final examination earlier than their less academically inclined peers. Psychological studies have revealed that the levels of aspiration and self-confidence of university students may be raised or lowered dependent upon their previous academic performances (Child & Whiting, 1949; Festinger, 1942; Hill & Dusek, 1969). In general, the findings have indicated that past academic success leads to the establishment of academic self-confidence and a raising of the level of aspiration, whereas past failure leads to the reverse. Thus, it was predicted that students who had been academically successful in the past would have a confidence level or level of aspiration, such that they would choose to finish the course requirements at an early date.

Previous investigation has also revealed a positive relationship to exist between achievement motivation and academic success (Kestenbaum & Weiner, 1970; McClelland, 1961). This finding provided the basis for the second hypothesis. A positive relationship was predicted to exist between the dates the examinations were taken and the grades attained on the examinations. Students who took the examination earlier were predicted to fare better than their peers who took the examination at a later date.

Method

Subjects

The subjects were 128 female and male undergraduate students enrolled in an Introductory Developmental Psychology course at the University of Windsor. The subjects were predominately in years II and III (Junior and Senior students) of a three year university program.

Procedure

The students' overall past grades were obtained from their university transcript. To convert students' letter grades into a numerical value the procedure presented below was followed:

A+ = 10 (87% and above); A = 9 (83-86%); A- = 8 (80-82%);

B+ = 7 (76-79%); B = 6 (70-75%); C+ = 5 (65-69%);

C = 4 (60-64%); D+ = 3 (55-59%); D = 2 (50-54%); F = 1 (49% and below).

During the first week of class the students were informed that they would be able to take the final semester examination on one of four dates. The first three examinations were held during the last six weeks of a twelve week semester. A two week interval separated each of the examination dates. The fourth examination was held during the week following the third date.

A list of eleven essay questions and a comprehensive reading list were distributed during the first week of class. Students were informed that they would be responsible for all material and all examination questions regard-

less of the date they chose to write the examination. They were also informed that once they had taken the test, they no longer had to attend class (although class attendance was always optional).

One month into the semester the students were asked to submit their choice of examination dates to the professor. Those choosing the first date were accorded a score of 4; the second date, 3; the third, 2; and the final date, 1. Two of the eleven essay questions were chosen at random for each examination date. Objective grading criteria were prepared before final marking. Interjudge reliability was assessed by having two readers individually grade twenty-five examinations. The correlation coefficient was .96.

Results

A Pearson product-moment correlational analysis revealed a significant positive relationship to exist between the students' overall past grades and their choice of examination dates ($r = .40, p < .01$). Furthermore, an analysis of variance calculated for mean overall grade average by choice of examination dates was highly significant ($F = 5.89, df = 3/124, p < .001$). Previous overall grade means and standard deviations are presented in Table 1. The data indicated that the earlier the test was written, the higher the students' previous grade average.

TABLE 1
MEANS AND STANDARD DEVIATIONS OF STUDENTS' PREVIOUS
OVERALL GRADES

	1	2	3	4
Date				
\bar{X}	6.50	6.67	5.51	4.75
SD	1.00	1.37	1.47	1.48
N	8	14	78	28

Correlational analysis also revealed that a significant positive relationship existed between the date of examination and the grade attained by students ($r = .49, p < .01$). An analysis of variance computed for grade means on the four examination dates produced significant results ($F = 4.81, df = 3/124, p < .01$). Follow-up "t" tests revealed significant mean grade differences between dates 1 and 2 ($t = 3.41, p < .01$), dates 1 and 3 ($t = 3.07, p < .01$), dates 1 and 4 ($t = 4.94, p < .001$), dates 2 and 4 ($t = 4.99, p < .001$), and dates 3 and 4 ($t = 4.66, p < .001$). Grade means and standard deviations are presented in Table 2. The data reveal that the earlier the test was written, the higher the students' mean grade on the test.

Discussion

The purpose of this study was to examine the relationship of university students' self-selection of examination dates with their previous and subsequent academic performance. It was hypothesized that those students

TABLE 2
MEANS AND STANDARD DEVIATIONS OF TEST SCORES
(Maximum Score = 36)

	Date			
	1	2	3	4
\bar{X}	33.69	27.07	24.85	20.59
SD	1.54	3.64	4.92	7.25
N	8	14	78	28

who had been academically successful in the past would choose to take a final examination earlier than those who had not done as well previously. Secondly, it was hypothesized that a positive relationship would exist between the dates the examinations were taken, and the grades attained on the examinations. Both hypotheses were significantly supported.

A comparison of mean scores on the four different tests revealed that students, through their own selection of examination dates allocated themselves into three distinct groups. The superior group ($N = 22$) took the examination on either of the two earliest possible dates and received a grade average of 81 percent (A-). The average group of students ($N = 78$) chose to take the examination on the third date and received an average grade of 69 percent (C+). Finally, the below average group ($N = 28$) took the examination on the last date and received an average of 56 percent (D+).

The results indicated that a number of factors may have been responsible for the students' choice of examination dates. One probable determinant of examination choice seems to have been previous academic performance. It may have been that receiving good grades in the past was highly reinforcing for the student and, thus, may have functioned to give students confidence regarding their own academic abilities.

Support for this interpretation stems from the high positive correlation found to exist between the students' previous overall grades and the date on which they chose to write the examination. Further support for this notion derives from the aforementioned studies of level of aspiration (Child & Whiting, 1949; Festinger, 1942; Hill & Dusek, 1969).

Another possible interpretation of the students' choices of examination dates may be that brighter students are more highly achievement oriented and less prone to test anxiety (Kestenbaum & Weiner, 1970; McClelland, 1961). As a result, these students might wish to fulfill required tasks earlier. The data indicated that those students who chose to write the final examination during either of the first two dates had grades that were academically well above average in the past. Moreover, those students did, in fact, appear to master the course content earlier and much more successfully than their peers. On the other hand, students who had done poorly in the past may have been rather anxious about taking the examination, thereby trying to delay their taking the test for as long as possible.

In conclusion, average and superior students appeared to have fared well through self-selection of examination dates. Those students who did

poorly, however, may have required a longer period of time in which to prepare for this particular examination. Thus, the results of this study tentatively suggest that university residential requirements should be made to vary with the academic abilities of the students.

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The Effects of the Technical Education Act 1919-1929

The Technical Education Act may be "of significance in the growth of vocationalism in twentieth century Canadian education", as Stamp says. It is also significant in that it demonstrates what can happen when the Federal Government attempts to impose a system of education on the Provinces without adequate study and without the constitutional power to enforce its program.

In an article in the *Canadian Historical Review* of December, 1971 entitled "Technical Education, the National Policy and Federal Provincial Relations in Canadian Education, 1899-1919,"¹ Robert M. Stamp, Associate Professor of Education at the University of Calgary, stated that the Technical Education Act of 1919 was an outcome of the National Policy. The National Policy was designed to encourage the growth of Canadian industry. Industry, however, required skilled labour so that shortly after the inauguration of the protective tariff in the federal budget of 1879 agitation began for the provision of skilled workers through a program of technical education at the high school level. Both the Canadian Manufacturers' Association and the Trades and Labour Congress pressed the Federal Government for action during the first decade of the twentieth century, but Prime Minister Laurier was not convinced that the Federal Government had the power to enact legislation in the area of education. It was not until 1910, at the urging of Mackenzie King, Minister of Labour, that Laurier agreed to a Royal Commission to study the question of technical education. The Royal Commission on Industrial Training and Technical Education (the Robertson Commission) reported in 1913 recommending federal support for technical education. Sir Robert Borden (who had defeated Laurier in 1911) was in power at this time. Although he had previously spoken out in favour of federal support for technical education, he took no action on the recommendations of the Royal Commission until 1919 when his government introduced the Technical Education Act.

Stamp concluded that the Act was "of significance in the growth of

vocationalism in twentieth century Canadian education.”² The Act, however, failed to accomplish its goals and the reasons for this may prove to be equally significant to the future of Canadian education. The legislation was designed to encourage the provinces to establish courses and schools for technical education. The underlying assumption was that each province ought to be able to provide its students with an equal opportunity to learn a trade or skill. In practice the legislation did not encourage many of the poorer provinces to make any significant improvements in their facilities for technical education. Furthermore, the lack of industry in some provinces led them to believe there was no need for technical education. As a result, students in some provinces had much less opportunity to learn a skill or trade than in others.

The Act was the first attempt by the federal government to enter the field of technical education. In drawing up the Act, the federal government had no previous Canadian experience to look to except perhaps the Agricultural Instruction Act, 1913 which it seems to have ignored. Furthermore, in some provinces little if anything had been done in the way of technical education, and the feeling was that there was no real need for any action along the lines proposed by the Federal Government. In short, the program lacked funds, adequate administration, and expertise.

The chief roadblocks to the smooth functioning of the legislation were the lack of funds and the method by which they were allotted; the inadequate supply of properly qualified teachers; the lack of sufficient administrative staff; and the constitutional restrictions on the staff. The Robertson Commission recommended that a total of \$3,000,000 be set aside over a ten year period for technical education. Although adopting many of the other Commission's recommendations, the federal government only gave one-third of the recommended amount despite the Deputy Minister of Labour's statement that “in 1913 . . . the value of the dollar was much higher in relative value than in 1919 . . .”³

Prof. L. W. Gill, the Director of Technical Education, noted that

The increased cost of building and of equipment will no doubt adversely affect . . . development as it will present an insuperable difficulty to some of the smaller towns and cities. As an illustration . . . for a city with a population of 50,000 the cost of building and equipping a technical school to meet ever present needs will exceed \$200,000. Yet the total amount available from the federal grant last year (1919-20) for the largest of the western provinces was only \$51,832.⁴

Prof. Gill concluded that:

To assist in overcoming this difficulty it may be necessary for the Federal Government to aid the provinces on the more liberal scale recommended by the Royal Commission.⁵

The distribution of the funds worked to the disadvantage of the poorer provinces. According to the terms of the Act, “payments from the federal grant are to be made only on condition that an equal amount is expended on technical education by the Provincial Governments.”⁶ This meant that provinces such as Nova Scotia, which underwent a severe economic depression during the decade of the 1920's, were unable (although perhaps willing) to take full advantage of the federal grants. According to the Deputy Minister of Labour, “the only reason (Nova Scotia) has not been

able to place technical education on a proper basis is solely because of the prolonged hard times that have prevented her and the municipalities from securing enough revenue to balance modest public programs of expenditure.”⁷

The report continued:

The majority of her (Nova Scotia's) people are engaged in industries other than agriculture. They are convinced of the value and necessity of this form of training, but have simply been financially unable to carry it out.⁸

Nova Scotia, as well as all other provinces except Ontario, was unable to claim its full allotment because of a provision in the legislation which allowed only 25 per cent of an unexpended or unearned balance to be carried forward. (See Table 1, pg. 12). The Act had been designed “to encourage and promote” technical education, yet Ontario, the province which received the greatest financial support, needed the least “encouragement” while a province such as Nova Scotia, which was willing but unable to take advantage of the legislation, was penalized for its poverty. Some, such as John Kyle, Provincial Organizer for Technical Education in British Columbia, thought this system was equitable:

We naturally lament the monies which revert to the Dominion treasury but after all it acts as a fine on provincial authorities who persist in retarding educational progress. The acting principle is to help those provinces that are willing to help themselves.⁹

Another deterring force to the poorer provinces was the provision that the Act terminate after ten years. According to the federal Department of Labour:

Some of the provinces hesitate to increase expenditures on vocational education, knowing that the Technical Education Act expires in 1929. They fear that they may build up a system of education which will involve greatly increased expenditures for the future and that they will be called on to bear the full cost after 1929. Undoubtedly the work would make more rapid progress if permanent federal assistance were assured.¹⁰

While federal financial support was not made permanent, the Act was extended to allow most of the provinces to take advantage of unexpended balances. Yet in one province at least, Nova Scotia, “the amount of the unexpended balance (fell) far short of enabling the local government to assist the towns and cities to provide as extensive vocational training as now exists in Quebec or Ontario.”¹¹

The 25 per cent clause as well as the matched payment clause also proved to be deterrents to the growth of technical education on a nation-wide basis during the early part of the 1920's. An economic depression left the provinces without adequate financial resources forcing them to curtail programs in all areas. According to the Annual Report of the Department of Labour for 1922-23:

Provinces have reduced expenditures wherever possible and in some places vocational work has suffered along with other branches of education. The expenditures by the Provincial Governments on work coming within the provisions of the Technical Education Act decreased from \$2,201,534.03 in 1921-22 to \$1,835,093.20 for the past year, causing a corresponding decrease in the federal grants from \$720,336.05 to \$648,227.03. Classes have been discontinued in a

number of smaller places and there has been a decrease in the enrolments in the western provinces and in New Brunswick . . .¹²

The Robertson Report recognized the need of an adequate supply of well qualified teachers if a program of technical education were to be successful. There was a widespread agreement on this topic. Prof. Gill wrote that "in any educational work the teacher is by far the most important factor . . ."¹³ Senator Robertson, the Minister of Labour responsible for the administration of the Act at its inception, told the National Conference on Technical Education in 1920 (which was composed of officials from all the provinces who were responsible for the administration of the Act) that:

I may perhaps be pardoned for making the suggestion to you that there is one subject in particular, which ought to receive very serious and careful consideration at your hands, and that is the question of how best to provide means whereby a competent staff of teachers may be available for the needs of technical education in all our provinces.¹⁴

The problem of teacher education was twofold. First, there had to be an adequate supply of teachers which, it would appear, there was not in 1920. The Chairman of the Conference, G. P. Smith, the Minister of Education for Alberta stated that:

In spite of teachers' salaries doubled, in spite of the standards of qualifications having been raised, in spite of many things having been done that should make the teaching profession attractive and permanent, we find the enrolment in the normal schools in almost every province seriously reduced and the shortage of teachers increasing.¹⁵

The second problem was how to give the best training possible to teachers of technical subjects with the available financial resources. Wrote Prof. Gill:

It is within the financial possibilities of the provinces of Ontario and Quebec to provide teacher-training institutions which will meet their own needs, but at the present time it would be too great a burden for the other provinces.¹⁶

The solution to the problem as proposed by federal representatives was a co-operative Canadian effort. In his opening address to the First National Conference, Senator Robertson told the delegates:

. . . if . . . you find that there is any plan which can be adopted whereby you, unitedly, and we in co-operation with you, can bring about some centralized arrangement to provide a competent staff of teachers, better trained and better qualified than would be possible by the separate action of the provinces, we desire to do everything to strengthen your hands and to promote the efficiency of the service . . .¹⁷

Prof. Gill, the Director of Technical Education for Canada, also recommended a co-operative effort and suggested that the federal government would lend its financial support to the project.

. . . the problem, considered from a national standpoint, can be really solved only by co-operation on the part of the provinces . . . If the Provincial Governments can agree on some form of co-operative action, I am sure the Federal Government will aid in solving the problem. It has been suggested to me that the Federal Government should organize and administer an institution for this purpose, because it is a national work. This is neither possible nor desirable. The Federal Government may help, but local initiative must not be destroyed.¹⁸

With the encouragement of both Robertson and Gill, the Conference adopted the resolution that:

The Federal Government and the various provinces co-operate to establish and maintain one central institution for the adequate training of special teachers for vocational education.¹⁹

For financial, constitutional or other reasons the federal government failed to support the resolution.

The effects on the program were disastrous. The Annual Report of the Department of Labour for the year 1921-22 stated:

The chief reason for the decrease in the rate of expansion (for 1921-22) is the lack of adequately trained teachers to undertake the work. In their efforts to take advantage of the federal aid, the provinces, in some cases, entrusted the work to inexperienced teachers with the result that the work of these places has not been properly developed and in some places abandoned.²⁰

Only one province, Ontario, ever established a teacher training institution during the life of the Act. For financial reasons, the other provinces were unable to do so. As a result, the quality of the training provided was generally admitted to be of a very low standard.

The problem arose because the federal government had instituted a program for the whole country without examining the capacities of the individual provinces to undertake their share of the program. The federal government encouraged the provinces to take advantage of the offer of grants quickly and, as a result, the provinces were pushed into conducting a program without adequate preparation, thus to a large extent nullifying the objectives of the federal legislation.

The success of any piece of legislation depends in part on the ability of officials concerned to administer the program equitably. The Technical Education Act unfortunately, did not lend itself to equitable administration. The federal government, which changed from Unionist to Liberal in 1921, did not seem interested in making a special effort to cope with a difficult problem. In 1919, Prof. L. W. Gill was appointed Director of Technical Education, and a year later A. W. Crawford was appointed as his assistant. Gill had drafted the agreements with the provinces, and was the only person with the necessary expertise to administer the Act. When he resigned in 1921, Crawford was appointed to take his place. Crawford resigned in 1929 after seven frustrating years. No new Director was appointed. While Crawford was ineffective, the conditions under which he worked were to a large extent the cause of his problems. He had only a small clerical staff and was solely responsible for dealing with the provinces. This was a difficult task for, as Gill explained: "According to the terms of the Act, technical education is defined broadly enough to cover almost any educational effort."²¹ The problem of what kinds of work should receive federal grants was one with which Crawford had a great deal of difficulty and never succeeded in solving. In his report for 1923-24 he said:

No fixed standards have been established by which the courses in the various schools can be compared, and it is a very difficult matter to determine the eligibility of certain courses for federal grants . . . Because of the varying industrial conditions in each province and because of the newness of secondary

vocational education, a very liberal interpretation has been placed upon the foregoing definition.”²²

Crawford raised two other difficulties in the above statement. Some provinces, especially Saskatchewan, Manitoba, Prince Edward Island and Nova Scotia “lacked . . . interest in the development of industrial training.”²³ The main interest of these provinces was agriculture, and although funds had been provided for agricultural instruction, the Agricultural Instruction Act terminated in 1923. The situation was most serious in Prince Edward Island. H. H. Shaw, Superintendent for Education in P.E.I. (P.E.I. had neither a Minister of Education nor Director of Technical Education), explained the situation to Crawford:

I think that for our young people the greatest vocation is agriculture. The next greatest vocation is school teaching. The next is clerking in stores or businesses. These three vocations to my mind are about all we have. You are assisting the vocations in the different provinces, and you must take them as you find them. You have to see in what way you can best assist the vocations that need assistance.²⁴

Crawford, however, took the position that provision for agricultural instruction was not provided for in the Act. He told Shaw:

If you find that it is impossible in Prince Edward Island to promote new work of the type the Act is intended to develop, I would say that unfortunately, you would be deprived of the benefits of the Act.²⁵

It would appear then, that almost half of the provinces were faced with the dilemma of either changing their educational system to meet what they felt was not a provincial need or lose a federal grant.

There was considerable pressure on the federal authorities to change their grant policies, perhaps the most important of which was the Royal Commission on Maritime Claims which stated that:

In Prince Edward Island there are no large industries which would justify establishment of an institution for technical education. As agriculture is their principal interest, the Provincial Government suggested that the technical education legislation should be given a broad application in their case, and that agricultural education should be deemed to be covered by the term technical education. We recommend this suggestion to the favourable notice of the department.²⁶

A few years later the federal government accepted the recommendation.

It was equally difficult to establish a national standard of technical education. The Federal Director was the only federal inspector of provincial programs, a task surely too onerous for a single person. Furthermore, as Crawford recognized, there were constitutional limits as to what action he could take. He told the Second National Conference on Technical Education in 1927:

The Dominion Government has nothing whatever to do with the organization, administration and control of educational affairs in the provinces. All we can do, and all we hope to do, is to assist you in promoting the type of work which this Act is intended to promote . . .²⁷

Yet the problem still remained. The Director found that “the character and quality of the work being done is not entirely satisfactory. If a reasonable

standard of efficiency were demanded before payments of federal money were made about one-half of the work which is now receiving a benefit from the grant would be excluded".²⁸ Crawford, however, realized that:

Courses in each province differ so greatly from similar courses in other provinces that it appears to be impossible to standardize. If that be true I would like it to be known. It would be useless to set up any standard only to find that some province could not reach it. For instance, the course that is now being carried on in Prince Edward Island would not be recognized as a vocational course in Ontario . . .²⁹

With a growing sense of frustration, Crawford summed up the difficulties:

I feel that as a Dominion Government official I should not undertake to inspect or criticize the work in any province. I should be free from that because it is a responsibility of the Provincial Government, not of the federal government. Unless the Provincial Governments are prepared to set up some standard which I can easily interpret, I am at a loss to know just how far to go. The mere fact of naming a course in a certain way and stating that the objective is so-and-so does not make it so, and I am not justified in paying grants simply because somebody tells me what objective he has in mind. Surely there must be some minimum standard that can be set up . . . Am I to set up the standard for such a province, or could not this Conference . . . set up some standard which would be my guide?³⁰

The Federal Director had no standard of issuing grants and no method of inspecting provincial work other than that of personal inspection. The Conference never did agree upon a national standard perhaps because of the diversity of interests across the nation. The British North America Act further bound the hands of the Federal Director by preventing him from imposing a national standard.

In anticipation of the expiration of the Act in 1929, it was resolved "that this conference . . . strongly urge the continuance of the technical education grant for a further period of ten years after the expiration of the present Act in 1929."³¹ King's announcement in 1928 that he would allow the Act to expire drew considerable protest from the Opposition and the provinces. Only Ontario had been able to draw its full allotment. Only 20 per cent of the \$10,000,000 for the ten-year period had been distributed. Saskatchewan, Manitoba, Nova Scotia, and Prince Edward Island had not been able to draw half or more of their allotment. With this in mind the Federal Government agreed to pass the Technical Education Extension Act in 1929 permitting an unexpended portion of \$10,000,000 to be carried forward and be available under the terms of the original Act during the next five years. The Government also agreed to permit the use of some funds for the promotion of agricultural instruction. The Depression however, curtailed provincial spending so the Act was extended for a further five years to 1939. As Table 1, shows, it was not until 1949 that Manitoba finally drew all of its allotment (see page 98).

The Act, therefore, did have some success in that it encouraged an increase in enrolments, classes and construction, although mostly in the wealthier provinces. There are indications, however, that it did not provide industry with a ready supply of skilled manpower. The number of persons over 14 years of age employed in non-agricultural pursuits did increase by about 23 per cent from 1921 to 1931.³² More specifically the number of persons employed in the manufacturing and mechanical trades rose by 17

per cent.³³ There is no information available which would suggest that we can attribute these increases to the Technical Education Act.

Perhaps a more vital question is whether the Act was successful on a national basis in both the quantity and quality of the manpower it created. It appears not to have been. Saskatchewan, Manitoba, Prince Edward Island and Nova Scotia were not really interested in the program and had drawn less than half of their allotted funds by the time the Act expired. The Depression, which closely followed the expiration of the legislation severely reduced the need for skilled manpower, if there ever was such a need.

Stamp concluded that "... the Technical Education Act of 1919 was not passed when the country faced a shortage of skilled workers, but rather at a time of industrial dislocation and slowdown".³⁴ When a more obvious need arose at the end of the 1930's there was a serious shortage of labour.

The quality of the program was seriously affected because the interests of the provinces were so diverse that no voluntary arrangements could be made to standardize the program. Federal administrators of whom there were too few) were unwilling to impose a uniform standard on the province for fear of intruding on the provincial jurisdiction over education. As a result, funds were put to a wide variety of uses including agricultural education, which the originators of the legislation had not intended. Moreover, it was the wealthier provinces that were able to take the best advantage of the legislation so that educational opportunity was not equalized.

¹ R. M. Stamp, "Technical Education, the National Policy and Federal Provincial Relations in Canadian Education, 1899-1919," in the *Canadian Historical Review*, Vol. No. 4, December, 1971, p. 404

² *Ibid.*, p. 423.

³ Canada, Department of Labour, *Annual Report*, 1927-28, p. 156. ⁴ *Ibid.*, 1919-20, p. 106.

⁵ *Ibid.*, p. 106. ⁶ *Ibid.*, p. 105. ⁷ *Ibid.*, 1927-28, p. 156. ⁸ *Ibid.*, p. 156.

⁹ Canada, Department of Labour, *Vocational Education Bulletin*. No. 12, "Proceedings of the Interprovincial Conference on Vocational Education April 17-18, 1925", p. 28.

¹⁰ Canada, Department of Labour, *Annual Report*, 1924-25, p. 70. ¹¹ *Ibid.*, 1929-30, p. 154.

¹² Canada, Department of Labour, *Annual Report*, 1922-23, p. 74. ¹³ *Ibid.*, 1919-20, p. 106.

¹⁴ Canada, Department of Labour, *Vocational Education Bulletin*, No. 1, p. 9. ¹⁵ *Ibid.*, p. 58.

¹⁶ Canada, Department of Labour, *Annual Report*, 1919-20, p. 107.

¹⁷ Canada, Department of Labour, *Vocational Education Bulletin*, No. 1, p. 10. ¹⁸ *Ibid.*, p. 16. ¹⁹ *Ibid.*, p. 17.

²⁰ Canada, Department of Labour, *Annual Report*, 1921-22, p. 65.

²¹ Canada, Department of Labour, *Vocational Education Bulletin*, No. 1, p. 16.

²² Canada, Department of Labour, *Annual Report*, 1923-24, p. 83. ²³ J. A. Maxwell, *op. cit.*, p. 211.

²⁴ Canada, Department of Labour, *Vocational Education Bulletin*, No. 20, p. 10. ²⁵ *Ibid.*, p. 10.

²⁶ Canada, Department of Labour, *Annual Report* 1926-27, p. 115.

²⁷ Canada, Department of Labour, *Vocational Education Bulletin*, No. 20, p. 8.

²⁸ Canada, Department of Labour, *Annual Report* 1920-21, p. 101.

²⁹ Canada, Department of Labour, *Vocational Education Bulletin*, No. 20, p. 15. ³⁰ *Ibid.*, p. 16 ff.

³¹ *Ibid.*, p. 5. ³² M. C. Urquhart and K. A. H. Buckley, *Historical Statistics of Canada*, Toronto, 1965, p. 59.

³³ *Ibid.*, p. 59. ³⁴ R. M. Stamp, *op. cit.*, p. 423.

TABLE 1
SUMMARY OF AMOUNTS PAID TO PROVINCES UNDER
THE TECHNICAL EDUCATION ACT 1

Year	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia	Total
1919/20	\$ -	\$ -	\$ 3,396	\$ 36,500	\$ 106,297	\$ 2,648	\$ 1,142	\$ 17,107	\$ 19,407	\$ 186,497
1920/21	2,700	24,193	10,408	167,886	294,111	7,268	3,534	41,438	29,133	580,671
1921/22	7,241	32,758	22,758	114,651	378,174	21,173	13,665	82,606	47,904	720,332
1922/23	5,858	33,166	17,476	128,182	314,206	25,121	18,263	71,019	34,932	648,223
1923/24	6,550	35,501	20,382	328,682	347,636	20,092	18,397	57,613	53,535	888,388
1924/25	1,950	34,623	43,040	263,399	347,636	19,500	17,249	62,215	40,860	830,472
1925/26	7,254	30,999	93,874	299,143	347,636	19,488	20,083	72,731	53,123	944,331
1926/27	7,757	31,494	76,208	403,944	347,636	20,056	18,021	85,789	56,627	1,047,532
1927/28	11,981	29,224	70,107	329,072	347,636	27,529	17,048	74,000	59,355	965,952
1928/29	20,369	47,083	48,637	372,890	347,636	28,527	25,159	92,222	169,637	1,152,160
1929/30	22,117	21,525	51,951	125,302	-	41,541	60,505	21,779	68,563	413,283
1930/31	30,790	73,669	50,025	-	-	38,621	198,289	-	-	391,394
1931/32	31,898	48,699	4,791	-	-	27,488	170,094	-	-	282,970
1932/33	29,370	50,628	-	-	-	46,169	75,567	-	-	201,734
1933/34	12,344	47,691	-	-	-	23,064	45,970	-	-	129,069
1934/35	-	39,615	-	-	-	9,430	41,673	-	-	90,718
1935/36	-	48,765	-	-	-	2,654	47,363	-	-	98,782
1936/37	-	32,471	-	-	-	14,099	21,533	-	-	68,103
1937/38	-	-	-	-	-	14,813	34,055	-	-	48,868
1938/39	-	-	-	-	-	27,116	-	-	-	27,116
1939/40	-	-	-	-	-	30,732	-	-	-	30,732
1940/41	-	-	-	-	-	18,340	-	-	-	18,340
1941/42	-	-	-	-	-	40,727	-	-	-	40,727
1942/43	-	-	-	-	-	18,703	-	-	-	18,703
1943/44	-	-	-	-	-	23,497	-	-	-	23,497
1944/45	-	-	-	-	-	25,061	-	-	-	25,061
1945/46	-	-	-	-	-	29,496	-	-	-	29,496
1946/47	-	-	-	-	-	25,425	-	-	-	25,425
1947/48	-	-	-	-	-	34,235	-	-	-	34,235
1948/49	-	-	-	-	-	29,001	-	-	-	29,001
Total	\$198,179	\$662,104	\$512,455	\$2,569,651	\$3,178,604	\$711,614	\$847,610	\$678,519	\$633,076	\$9,991,812

1. Canada, Department of Labour, Vocational Education, Bulletin No. 30, October, 1929, p. 42.

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The Uses of Attention

Ability to attend is considered in relation to mental retardation and learning disability. Following a theoretical and methodological treatment of certain aspects of attention, the use of attention as a criterion to distinguish retarded from nonretarded children is described. Some suggestions for optimizing attention during teaching are offered. Models for viewing learning disability in terms of attention, arousal and information processing are discussed. It is suggested that there is a need to rationalize theory and practice in the areas of retardation and learning disability, taking account of individual differences in attention and information integration.

In your eyes will be the darkness of ignorance but your mind will retain a flicker of recognition.

— Tagore

We attend to internal events as much as we do to external ones. Ideas and internal schemas not only force themselves into one's focus of attention, but "the flicker in the mind" can guide and maintain purposeful behavior. Attention is directional. It is an active, reconstructive, general cognitive function (Neisser, 1967).

Attention to both external and internal events can be measured in the same manner; probably they share the same neural mechanisms. Methods for measuring attention physiologically usually include recordings of electrical properties of the brain, increments and decrements in heart rate, respiration, electrical conductance of the skin, and fluctuations in blood volume. Thoughts and other cognitive activities can influence these physiological measures as much as stimulation by external agents.

As a child develops, he first attends to only external objects, but then around the age of two the idea of the object is also attended to. Perhaps the turning point is reached at the same time as the child learns to use speech and language. Schachtel (1959) has distinguished between auto-centric perception, which is confined to pleasure, pain, heat, cold and smell, and allocentric perception, which enables the child to have a grasp of the real world. Allocentric perception is representational. It involves

attending to conceptual schemata and is characteristic of adult attention. Attention is by no means passive; it is used actively by child and adult to reconstruct experience for higher cognitive functions.

The methods of measuring attention described above are, in fact, measures of the orienting response. Pavlov (1928, 1941) describes the orienting response as the "What is it?" response. The orienting response is selective in that it is not indiscriminately evoked by any stimulus and it can be conditioned and extinguished. As a response to novelty or discrepancy, it serves the dual purpose of facilitating the reception of significant stimuli while protecting the organism from reacting to inconsequential ones. Damage to the cerebral cortex often makes the organism attend indiscriminately to all sorts of stimuli in the environment. For this reason, the formation and maintenance of adequate orienting responses are often indices of a healthy cortex.

Sokolov (1960, 1963) has put forward a neuronal model of the orienting response based on his own and Pavlov's observations. Briefly, the model assumes the presence of a screening and an amplifying system in the cortex. The screening system incorporates a chain of neural cells which preserves information about the intensity, quality, duration and order of presentation of the stimuli. To these characteristics one may add the semantic characteristic when the stimulus is verbal. If an arriving stimulus does not match the information stored in the screening system, the orienting response is evoked via the amplifying system. The orienting response is thus not the result of indiscriminate stimulation by an external agent, but that of the noncoincidence of the stimulus and the neuronal screening model. The model can handle complex stimuli such as words and symbols as well as simple sensory stimuli. Essentially, it is an information measurement model which forms a program of stimulation and matches it with all in-coming stimulation in order to pick up discrepancies. The orienting response is a consequence of these signals of discrepancy. In Sokolov's model, the activation of the reticular formation by the screening model occupies a central role.

In our laboratory we have looked at changes in the heart rate and the conductance of the skin as two basic measures of orienting response. We would ask a child to listen to a series of words that he knows and press a button every time a certain word such as "man" occurs in the series. Let us further suppose that the word "box" always preceded "man" in the series. In most children, as soon as they hear "man" the heart slows down for a couple of seconds and the electrical conductance of the skin increases significantly. Usually there is a delay of from 1 to 1.5 seconds between the presentation of the word and the occurrence of changes in heart rate and skin conductance. Some children not only show these reactions to the word "man", which they are supposed to respond to by pressing a button, but also they respond to the warning signal "box" in anticipation of the word "man". Other words in the series do not produce any noticeable reaction.

Attention in retarded children

Several research workers in the area of mental retardation have noted that the retardate suffers from attentional deficit and this contributes to most of his learning disabilities (Luria, 1963; Ellis, 1963; Zeaman and House, 1963). The deficit is generally attributed to the retardate's weak central

nervous system. The weakness may reflect an immaturity and the relative absence of integration in the central nervous mechanisms which, in its turn, might be the consequence of specific or diffuse cortical damage. Whereas most developmental psychologists would agree that the retardate has an immature central nervous system, the association of a pathological condition of the cortex to retardation appears to be favored mostly by Soviet workers. In any case, the consequences of a generally weak cortex are seen in the cognitive activities of the retardate. The critical symptom of an attentional deficit in the retardate is thought to be his proneness to distraction by irrelevant stimuli in the learning situation. It may be described as a disinhibition of orienting response. Often, such distractibility will reflect the lack of an efficient screening system by which only stimuli having recognized signal values arouse the orienting response of the normal subject.

We have attempted to verify whether the retardate is really deficient in his attention by a series of experiments. Before carrying out these experiments, we expected, following Luria, that the retardates would give fewer orienting responses since their verbal system is too weak to maintain self-instructed behavior. The orienting responses in a learning situation, therefore, cannot be sustained by the retardate if we ask him to attend to the significant stimuli. Because of weakness in cortical functioning, the retardate cannot maintain an instructional set, hence he fails to concentrate and attends to "irrelevant" stimuli.

First, we wish to describe an experiment on the habituation of orienting response. Habituation of orienting response follows when a stimulus is repeatedly presented without any consequence. It is a natural phenomenon, a way by which an organism checks itself from unnecessary expenditures of energy by not attending to stimuli which have no immediate significance. Complex stimuli such as words or nonsense syllables should habituate more slowly than the simple ones like light flashes or tones. Mentally retarded children may require a number of repetitions of a complex stimulus to form an adequate model of the stimulus. Then comparisons between the stimulus and the model can be carried out. A simple stimulus such as a pure tone, however, requires far fewer repetitions for a model to be formed. In one experiment, we presented a tone, familiar words such as "love" or "friend" and unfamiliar nonsense syllables such as "yuf". We found that the galvanic skin responses were evoked by the tone, the word and the nonsense syllable; but when each of these stimuli was repeated over and over again, the responses to tone habituated much faster than the responses to word and nonsense syllable. Since we were using severely retarded children as our subjects in this experiment, it seems that for them word and nonsense syllable were complex stimuli, whereas a tone was a simple stimulus. For normal children, however, one may find that familiar words like "love" or "friend" would be as simple and readily comprehensible as a tone, whereas a nonsense syllable would be the complex stimulus.

Habituation of an orienting response such as a galvanic skin response can be resisted. It is achieved by making the stimulus an imperative signal for a motor response. An illustration is provided by an experiment where we compare retarded children with normal children of equal age. The task involved listening for half-an-hour to a series of six familiar words which

were auditorily presented by means of a tape recorder. The children were asked to detect the occurrence of the word "man" which was an imperative signal for button pressing. A preparatory signal word "box" always preceded "man". As mentioned before, the retarded children gave a significantly larger number of responses to the imperative signal "man", whereas the normals gave a greater number of responses to the preparatory signal which was "box". Why did the imperative signal evoke more frequent responses for the retarded? It has been observed that the less firmly established the response, the greater would be the galvanic skin response. It seems logical to conclude that the retardates could not expect the occurrence of the imperative stimulus as strongly as the normals did. For the retarded children, the greater frequency of the galvanic skin response was a sign of the uncertainty experienced by them.

We have seen that a stimulus ceases to evoke an orienting response within a few presentations if it is not attached to a motor response. However, if it is given a signal value, the orienting response is again elicited by the stimulus. The signal value of the stimulus can be given through instructions. It was demonstrated very clearly in an experiment where we first let the orienting response habituate to a certain stimulus, and then reinstated it through instructions. In order to establish habituation, the subject was asked merely to listen to some words such as "boy" and "chair" for about six minutes. At the end of this period the galvanic skin responses which we were using as an index of orienting response decreased substantially, but it was quickly reinstated by asking the subject to press a button as soon as he heard one of the words such as "boy" and to do nothing when he heard the word "chair". The orienting response to "boy" was immediately reinstated, whereas the orienting response for "chair" continued to be low and infrequent. In none of these experiments could we find gross differences between the normal and the retarded child's ability to attend to words which have a signal value, and not to attend to those which are irrelevant.

We have successfully demonstrated the use of instructions for establishing signal meaning as well as to inhibit attention to signals which have lost their meaning. It must be remembered that the orienting responses are autonomic changes, and are not voluntary; but their evocation and inhibition are mediated by cognitive processes. These cognitive processes control changes both in heart rate and in electrical conductance of the skin in retardates as effectively as in normal subjects.

Optimal conditions for attention

We have now carried out at least five studies in which normals and retardates were compared. A general deficit in attention, as indicated by the orienting response, was not found in the retarded children in any of these studies (Das, in press; Das & Bower, 1971; Bower & Das, 1972). This may be due to two special features in our experiment. Neither the young retardate nor the normal child has a fully developed verbal system. Hence it is difficult for him to maintain a response to self-instruction. However, at a mental age of five or better, the normal child, as well as the retarded child, begins to regulate simple motor acts through speech (Luria, 1961). We have used retarded children above a mental age of six years and perhaps

that is why orienting responses were efficiently maintained through the verbal instructions given by the experimenter. The instructions are interiorized by the subject; they produce an internal set which persists throughout the experiment.

The other reason for the efficiency with which the retardates performed the attentional tasks is to be found in the nature of the learning environment and the task itself. The tasks did not demand other abilities, such as comprehension or memory, in great measure. They were tasks demanding only attention. The learning environment was special. It was a noise-free laboratory environment without any distractions. The laboratory was bland, painted neutral grey, soundproofed, and had no distractors such as pictures or calendars. This laboratory environment was in contrast to the usual classroom for retarded children which has several distracting items: the dress and mannerisms of the teacher, the paintings and other handwork of children on the wall, and the activities and noise produced by other children in the classroom. Within our controlled setting, instructions could effectively draw the attention of the retarded children to the salient features of the task. If the implications of our findings can be generalized, we would suggest the use of verbal instructions to direct and guide the subject's attention, not only in academic programs, but even in non-academic classes such as arts and crafts. A special feature of our task was its duration of 20 to 25 minutes. This short duration, associated with familiar stimuli and involving minimal learning in the task, apparently optimized maintenance of attention. It seems reasonable to suggest that when task difficulty is increased, the task duration should be reduced to maintain the same level of attention. Perhaps, in ordinary classroom learning, the material to be learned should be presented not only in graduated steps, but the duration of the lesson should be shorter than 20 minutes. It is worthwhile to explore the possibility of short periods of learning in an isolated noise-free environment interspersed with recreational activity periods of longer duration.

Attention, arousal and learning disability

The measures of attention such as the galvanic skin response and heart rate have been used traditionally as measures of emotion or arousal. Arousal is closely related to the balance between excitation and inhibition in the central nervous system. The seat of arousal seems to be in the brain stem, especially in a structure called the reticular formation. The reticular formation is essential for understanding the orienting response. The screening and amplifying neuronal model proposed by Sokolov is intimately related to the functions of the reticular formation. For example, excitation is influenced by the reticular structure of the mesencephalic and the diencephalic areas, while the bulbous section of the reticular formation exercises predominantly an inhibitory action. Consequently, the stimulation of the ascending reticular formation facilitates galvanic skin responses, while removal or suppression of this reticular area significantly raises the threshold of galvanic skin responses to peripheral stimulation. What this means, essentially, is that an interaction exist between the emotional and orienting components of an organism's reaction to significant or novel stimuli.

Any professional, working with retarded or "learning disabled" children, notices a wide variety of individual differences in behavior. These differences can be grouped in three classes in terms of excitation and inhibition. There is the excitable type showing a high level of arousal, the inhibitory type with a low arousal level, and the balanced type where excitatory and inhibitory processes are in equilibrium (Luria, 1963). The first group could be called hyperactive, the second hypoactive. The hyperactive child, in whom excitation predominates over inhibition, finds it hard to establish complex forms of behavior where certain responses have to be suppressed and others have to be facilitated. He shows marked distractibility while doing a task; a simple question by the teacher, or the ringing of bells outside, may distract him completely so that he can no longer go on with the task. The hypoactive child is usually a slow child. He takes too long to acquire a response, and once acquired, the response fades away quickly. He is slow to take out his books, slow to gather his things when school is over, slow in asking questions or giving an answer.

At this point, it is instructive to compare the symptoms of the minimally brain-damaged child with the characteristics of the three types of children. Generally, it would seem that most of the characteristics of the typical brain-damaged child described by Strauss and Kephart (1955) would compare with the clinical group in which excitation dominates over inhibition. Strauss and Kephart list the following characteristics for the brain-damaged child: distractibility, breakdown of inhibition (mostly social), a high response intensity given by the children, and lastly, perseveration of the past response, even when it is no longer required. Each of the above is also a recognizable trait of the "excitable child" in Luria's classification (1963). According to Strauss and Kephart, however, the chief difficulty of these children is in spatial integration. These authors observed that the brain-damaged child has an incapacity to see simultaneously. Perhaps he always sees succession and only rarely can combine these successive events into simultaneous impressions. What of the four characteristics of the brain-damaged child? According to Strauss and Kephart, it seems that forced responsiveness to stimuli, distractibility, foreground-background disturbances, perseveration and the like can be traced to this primary disturbance or deficiency relating to the child's inability to see simultaneously.

It would appear, from the theory of Strauss, that the typical learning-disabled or minimally brain-damaged child should be hyperactive. However, if one accepts Luria's classification, it is not necessary that all learning-disabled children should be hyperactive. They could as well be hypoactive. Typically, though, clinicians concerned with learning disabilities do not take into account the slow child (in whom inhibition predominates) and the balanced child, who is neither hyper- nor hypoactive, but who might be weak in forming new habits as well as in breaking old ones.

We would like to propose that the relationship between level of intelligence and the level of arousal is orthogonal. We come across the hyperactive-bright child as well as the hyperactive-dull child. Some learning disability clinicians may limit their research to the hyperactive-bright child only. Similarly, we find in our classrooms bright children who are somewhat slow, as well as dull children who are slow. Indeed, in certain sub-

cultures, speed in performance is differentially reinforced. In a particular group, speed may be emphasized, whereas in another group accuracy and persistence may be preferred to speed. In the context of this double system of co-ordinates—intelligence and arousal—where can we place the learning disabled or the so-called minimally brain-damaged child? Perhaps a learning-disabled child may be found in all quadrants except one—the slow and bright quadrant. It is at best artificial to consider only the hyper-active-bright child as learning disabled, as some specialists maintain.

The area of learning disability is characterized by capricious definitions and labelling. Frequently, minimal brain damage or learning disability is confounded with the condition of mental retardation. The distinction between the two (that is, retardation and minimal brain damage) appears to be fixed by IQ—the deficient child with IQ less than 100 is labelled retarded, whereas a child with IQ above 100 is called minimally brain-damaged, even when both may display identical sets of symptoms (cf. Wender, 1971). Strictly speaking, learning disability should be identified in terms of a perceived difficulty in learning school subjects such as reading, writing and arithmetic. A child who has the potential to learn these skills, and yet has trouble in demonstrating efficiency in any one of them, could be justifiably called learning disabled. On the other hand, the label “minimal brain dysfunction” connotes a hypothetical etiological state of the brain which may cause certain behavioral dysfunctions, most of which become apparent only when the child enters school at the age of five or six. Therefore, the behavioral signs of learning disability and minimal brain damage are inextricably blended. It seems impossible to separate the symptoms of one from the manifestations of the other. For all practical purposes, it may be best to regard the minimally brain-damaged child as equivalent to the learning disabled child. Authorities in the field (Wender, 1971; Haywood, 1968) would concur with such a view.

But the relation between excitation-inhibition balance and minimal brain dysfunction is not as clear as we wish it to be. One may ask if the Strauss children and the predominantly excitatory type in Luria's category should share the same kind of cortical dysfunction. For instance, consider the effect of cortical excitation on arousal, and contrast this with the effect of cortical inhibition. Eysenck (1967) has hypothesized that cortical excitation is behaviorally manifested as the inhibition of autonomic responses. In contrast, cortical inhibition is manifested in behavioral arousal or an augmentation of autonomic activities. The brain-damaged children studied by Strauss may in fact be cortically inhibited. This might be supported by the fact that there has been an increased use of amphetamines to control excitability in the minimally brain-damaged children. Amphetamine has a paradoxical effect of quieting or depressing the brain-damaged child, whereas it acts as an excitant for an adult. If one assumes the level of cortical inhibition to be high in the brain-damaged child, then amphetamines being excitants would decrease the level of cortical inhibition which would then result in a greater cortical control of autonomic processes. Wender considers the amphetamine test as crucial evidence in classifying a child as minimally brain-damaged.

It is apparent from the above discussion that one needs a rational

model for interpreting the behavior of the brain-damaged child and subsequently to design appropriate remedial procedures. Such a model cannot be arrived at as a by-product of psychometric testing because the majority of tests given for detecting basic deficiencies in the so-called learning disabled or brain-damaged child do not often have either a sound theoretical basis or practical validity. It is noticed that the difference between a learning disabled child and his classmate in a certain test may disappear once the tester controls for IQ. In other words, variations in performance on diagnostic tests of learning disability may not exist when one partials out the effect of intelligence. Some widely used tests, such as Frostig's, have a high loading on general intelligence. Apart from these theoretical considerations, when one looks at the practical validity of such tests and the remediation procedures they recommend, one is surprised to find that the remediation improves the test behavior itself, and does not generalize to compensate for the academic deficiency for which the child was referred to a clinic in the first place.

Learning disability and information integration

A rationale for viewing minimal brain dysfunction or learning disability may be suggested here. School learning in the lower grades may be simply considered as consisting of two basic processes: the registration of information and the processing of information. Registration involves sensory perception and communication to appropriate areas of the cortex where further analysis may be carried out. Since all incoming information at any given moment cannot be registered, the child has to select and screen the information that he receives. In other words, registration is a directional process, and may reflect active search and thinking. One can describe it as selective attention and concentration, a variant of which we study under the orienting response.

As mentioned previously, it is hard to separate the components of arousal from attentional responses such as the orienting response. Therefore, individual differences in arousal level become important when registration of information is considered. If the child is prone to distraction because of an abnormally high arousal level, then the presentation of the task should take this into account. On the other hand, if the child is hypoactive, slow to be aroused, the learning situation should be designed to offer a relatively greater amount of stimulation rather than to minimize the number of stimuli. In short, individual differences in attention should be considered. After information is registered, the analysis and integration of the information plays a critical role in learning. Information can be processed in sequence or in a parallel form. Luria (1966) calls this successive and simultaneous synthesis. In simultaneous synthesis, the child is required to arrange the input in a simultaneous array in order to arrive at the judgement, whereas in successive synthesis the input must be arranged in sequence. I have recently used a set of tests which measures successive and simultaneous integration (Das, 1972, 1973). Factor analysis of these tests showed that tests such as Progressive Matrices, Figure Copying and Memory for Designs have a high loading on simultaneous integration, whereas other tests such as Short-Term Memory and Serial Recall have high loadings on the successive integration factor. In addition to these two

factors, we also obtained a third factor which appears to be the speed with which information is processed. Thus, if the problem of the learning disabled child does not lie in the area of attention, but of information processing, then one has to determine whether a child experiences difficulties in simultaneous-spatial integration or in successive-temporal integration. We have already referred to the fact that the minimally brain-damaged child described by Strauss experiences particular difficulty in simultaneous processing. Once the difficulty of the child in the area either of simultaneous or successive integration, or the speed of integration, is identified, then appropriate remedial procedures could be instituted. For example, if a child has problems with simultaneous integration, alternative methods of teaching which lay emphasis on successive integration may be devised.

Conclusions

Attention is thus found to be a critical variable in considering the learning abilities of mentally retarded and "learning disabled" children. With regard to the retarded child, an extension of the conditions prevalent in the laboratory to the learning situation in school should be given serious consideration. Distractibility is not unmanageable; for, it was observed in a number of studies in our laboratory, that the retardate's attention as indexed by the orienting response could be evoked and maintained as efficiently as it could be in nonretarded samples.

The relationship between orienting response and arousal needs to be considered in the context of individual differences in arousal level. The hyperactive child is only one of possibly three types of children, the others being the hypoactive and the balanced types. Although the "learning disabled" or "minimally brain-damaged" child is usually identified with the hyperactive child, it does not seem quite justified to do so. It is suggested that the relationship between intelligence and arousal level is orthogonal and that the "learning disabled" and the mentally retarded children can be assigned to one of the four quadrants of the co-ordinates, depending on their IQ and arousal level. From another point of view, the learning disabled child may be considered to have problems with the registration and integration of information. Information registration is closely related to the orienting response, whereas integration may involve at least three abilities—simultaneous and successive integration, and the speed of integration. In remedial work with the learning disabled child, it is important to determine the source of his difficulty in terms of information processing, and then formulate a remedial program.

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Soviet Studies in Language Acquisition

This article surveys the special theories and empirical studies of language acquisition carried out by Soviet psychologists, especially in the period since 1950. The basic principles of materialism, historicism and social reference characteristic of Soviet Marxist psychology are placed in contrast to certain current tendencies in American linguistics. The relevance of the Soviet experimental studies for the understanding of child development is brought out.

Most of the Soviet studies of language have been carried out by, and for, psychologists, so it is necessary at the outset to characterize Soviet psychology. It is a much more monolithic field than American or European psychology, because from about 1923 attempts have been made to base it on a single theory: dialectical materialism. This has succeeded from about 1955. This philosophy has three basic principles which must be followed. First, psychology must be *materialistic*, not idealistic. Consciousness is a reflection of outer, material reality. Matter is primary, and consciousness is derivative. Thus there is no dichotomy between thought and matter. All mentalistic theories postulating "innate" mental processes are rejected automatically. Rather than being an object of philosophical inquiry, mental processes must be investigated scientifically in the field of physiology (Simon, 1957). This view obviously owes much to the pioneering work of Pavlov.

Secondly, psychology must take a *historical* view. Not static phenomena, but the development of the formation of mental processes must be the object of study. All things must be studied in their movement and change; and in connection with other related phenomena (Luria, 1959). Movement is conceived of not just as mechanical motion; movement can be in quality too. Matter in motion is primary; this "generates" everything else (Simon, 1957).

Thirdly, psychological activity is considered to be *social* activity. Social circumstances determine mental development. Changes in the form of the child's activity can cause changes in the organization of his mental pro-

cesses; therefore education, a different kind of social interchange, can be of key importance in mental development (Simon, 1957).

Since Pavlov influenced much subsequent psychology, it is necessary to know what theories he proposed and what terminology he used. Even those Soviet psychological studies which do not fit in with Pavlovian theory use this terminology so as to conform to the "party line". Pavlov was the discoverer of the conditioned reflex, and concluded that all higher nervous activity is effected through the mechanism of unconditioned and conditioned reflexes. It is the cerebral cortex that forms new connections between the organism and the environment; nervous processes are behind all psychological processes (Simon, 1957). Pavlov also found that words are also environmental stimuli in special ways, that language and speech constitute a "second signal system" (Simon, 1957).

Some terms important in reading Soviet studies are:

"temporal connection" means a conditioned reflex, and refers to the neural connection made in the cortex relating the organism to his environment. "a signal system" is a system of secondary "conditional" stimuli that trigger responses.

"excitation" refers to the process of stimulation which activates a response and is opposed to "inhibition", the repression of a response.

"the law of irradiation" refers to the fact that excitation and inhibition begin in a focal point of the brain and then radiate, or spread, to other areas, causing a "generalization" of their effect.

"the law of concentration" refers to a narrowing of the focus of excitation or inhibition causing discrimination between stimuli.

Pavlov developed an extremely complex and detailed concept of the organism as a self-regulating system, functioning in and adjusting to the environment through a learning process which is mediated through association processes operating at the cortical level. His views are radically different from those of the American school of behaviourism—Watson, Guthrie, Lashley, Skinner.

An important difference between American and Soviet psychology lies in the definition of the function of psychological study. The Soviet interest in psychology is mainly based on the belief that it is a means of helping create the new "Soviet citizen", of providing a "scientific foundation for directing the development of the individual." (Kostyuk, 1968). Psychology is used as a basis for educational policies, the problem of child development being of central concern. These differences are reflected in Soviet language research.

"The Psychology of Speech"

The source of mental processes is social, and they develop in communication with their people. The central process of the child's intellectual development is the transmission through adults of knowledge; this transmission is by speech. Thus, the study of speech, the basic means of communication, has always been an essential part of Soviet psychology. (Luria, 1959).

Taking a historical approach, Soviet psychologists believe that the phylogenesis (changing of the animal to the human brain) and the ontogenesis of consciousness (mental development from the child to the adult)

are dependent on language and speech. Much research has gone into investigating the exact relationship of thought and language.

In terms of phylogenesis, Vygotsky summarized research with animals showing that speech and thought arise from different roots in animals; their thinking is unrelated to speech. For example, apes have the necessary vocal apparatus for speech, but they do not speak; they use sounds only as a means of expressing emotional states. Intellectually, they are capable of using signs functionally, but their thought is related to vision and not to the articulatory system. When solving a problem, such as getting food which is out of reach, they must *see* the solution—a stick—before they can figure out what to do. There is no close correspondence between thought and speech in apes as there is in man (Vygotsky, 1962).

Ontogenetically, thought and speech development in man are not congruent, nor even parallel. There is a pre-intellectual phase of speech, in which children use sounds for emotional release. There is also a pre-speech phase of thought development, in which children learn to use tools in the same way as apes. At age two, the thought and speech lines converge: thought becomes verbal, speech becomes rational. At this stage, the child actively seeks out names for things, rather than passively listening to words spoken to him. Before two, his learning of the names of objects is a matter of conditioned responses, in which repetition of a word in connection with a given object finally becomes a connection in the child's mind. This involves only the first system of signals as in animal subjects. After two, the child is himself curious about words, and begins to use them creatively (Vygotsky, 1962). In this way, the child passes over to the second signal system, uniquely characteristic of human beings.

Since philosophically, Soviet psychologists reject all mentalistic theories and refuse to view any one thing, such as verbal processes, in isolation from others and not as part of a total environment with mutually interacting parts, Soviet speech research has always been "psycholinguistical." The term itself was not used until 1967, by A. A. Leontiev. Before that it had been called "the psychology of speech" (Slobin, 1969).

A comparison of recent Soviet and American psycholinguistic studies shows the interesting fact that the two lines of thought, so different in origin, seem to be converging. Americans have discovered more recently than the Soviets that the investigation of language cannot be carried on in isolation, since speech is a social, and a psychological, as well as a linguistic activity. In a lecture, George Lakoff has ventured to say that there is no real distinction between competence and performance; that grammaticality is not an abstract category but is connected with concrete instances of conversation. Soviets linguists would agree whole heartedly. For example, Raevsky states that the opposition of language and speech (language is social and speech individual) by foreign authors is artificial; both language and speech are social (Raevsky, 1958).

Secondly, the pendulum of American thought is swinging away from Chomsky's mentalistic "innateness" theories. To say that children possess an innate capacity for language is hardly an explanation for their amazing acquisition of such complex structures. Soviet research on the phylogenetic

development of speech, and studies of the relationship of thought and speech are more illuminating.

Americans are also beginning to examine psycholinguistic data for possible uses in education. A. E. Suprun (1968) was incredulous that Chomsky could make such a statement as "no one teaches the child (language)"; the Soviet view is that society teaches the child, and that greater knowledge of how children learn will make society's task easier.

Child acquisition of language: psychological emphases

Soviet research on the acquisition of a first language emphasizes the functions that speech performs and how these functions are related to the development of speech. The first and most basic function of language is communication (social interchange). This is accomplished even before any speech sounds can be produced by the infant by intonation patterns. R. V. Tonkovo-Yampol'skaya studied "the development of speech intonation in infants during their first two years of life." She found that intonation has definite physical characteristics that are related in a unique structure, which she terms the "intoneme." By correlating an electroacoustical analysis of intonograms with observation of the emotional state and behavior of the infants while they were producing the sounds, she answered the questions: does the cry of a newborn baby have any intonational structure? What are the intonations in the babbling of the 0 to 1 year old? Are they communicative? What are the characteristics of the intonation repertory of infants in the second year?

Her data showed that the cry of a newborn infant *does* have an intonational structure. In fact, comparing these with adult intonogram patterns, she found that the adult discomfort intonation is the same as that of the newborn baby. The 2-month old has two intonations, for comfort and discomfort. Between 3-6 months, two more intonations are added, happiness and laughter. It is definitely intonation that communicates these emotional states to the adult, because often the phonetic components are the same. Between 6-12 months, new intonations arise: exclamatory delight, and requesting, probably learned by imitation of adults. During the second year, only the questioning intonation is added; at this age more energy is being spent on phonetic and morphemic mastery than on intonation (R. Tonkovo-Yampol'skaya, 1969).

Although the evidence is not conclusive, such a study calls our attention to an area that foreign language teaching has often neglected: intonation as an integral part of the language and a basic requirement for communication. No matter how complete the student's mastery of the phonetic and syntactic features of a language, the wrong intonation patterns will constitute a strong foreign accent. A greater emphasis on intonation in the early stages might allow for more communicative drills; in the early stages of learning a new language, when students have very limited vocabularies and sentence patterns, it is difficult to put them in communicative situations. If they were taught intonation patterns first, perhaps along with other non-linguistic means of communication such as gesture, initial dialogues would be more interesting.

Language does not arise automatically in humans. Wild children who

grow up without human contact do not acquire language. The Soviet view is that children's speech arises only out of a need for communication with adults and with other children. A. R. Luria has carried out an interesting investigation proving this point, using a set of twins who had retarded speech but no mental retardation; their speech deficiency was partly congenital and partly due to their social situation. Twins occasionally have retarded speech since they are together constantly and know each other so well they don't need to express themselves verbally. Up to the time they were 2 years old they knew no words; at 2½ they knew "mama" and "papa", at 4 they had their own autonomous language they used with each other and a few real words they used with adults only.

Their "autonomous language" consisted lexically 84.3% of very common or distorted words, and 11.7% of autonomous words which had meaning for them alone. Single words applied to whole groups of objects, such as "makoka" (morkovka—carrot) for carrots, turnips, plums, and even watermelons! Certain objects had several names, such as "abaka" and "abba" for sobaka (dog). 20% of all their spoken words were their own names. Obviously, these words could have no fixed meaning; their meaning was determined by the concrete activity going on (this is called "synpraxic" speech). There was no "grammar"; the word was completely interlocked with activity in 92-94% of all cases. Similarly, they did not understand speech when it was not connected to a concrete situation, and did not understand grammatical features. (While playing that they were on a boat, they were asked, "Where are you going?" They answered, "The boat.")

In order to determine how much the social situation determines language acquisition, the twins were placed in separate kindergarten classes. After only 3 months, they started using real speech; there was an increase in their real vocabulary, extended phrases of the subject-verb-object type arose, and speech took on planning and narrative functions as well as accompanying concrete activity. Synpraxic speech fell to 44% and 60% of all speech. Thus, with a change in their social situation, the structure of the twins' speech changed rapidly and drastically in lexicon, grammaticality and function (Luria, 1959).

Luria's conclusion that grammatical speech will not arise if there is no objective necessity for speech communication reveals one of the basic weaknesses of foreign language teaching. Students are often drilled and drilled on grammatical points, but seldom given the opportunity to communicate in a real situation: they rarely *need* to use the language. Perhaps real communication, and not just the formation of "habits" is what is necessary in the classroom. Communicative drills, in which there is no control of response and in which the teacher's reaction is to what is said and not how it is said might help solve the problem of the student who can zip through pattern drills and exams without being able to speak an original sentence.

The second function of language is to aid the development of thought processes. Thought and speech have a dialectical relationship; thought processes influence speech, and speech changes thought processes. The Soviets dismiss the theory that thought and speech are the same; that one always thinks in language; they also dismiss the theory that there is an absolute disjunction between speech and thought.

Vygotsky agrees with Piaget in Piaget's demonstration that the difference between adult and child thinking is qualitative and not quantitative: the ability to think evolves during the course of one's life. However, Piaget theorized that the evolution of thought is from autism (in which there is no adaptation to external reality) through egocentrism (concern only with self), to adult, socialized speech. During the period of egocentrism, speech is most often in the form of a monologue: Piaget concluded that this is purely individual speech, a symptom of an egocentric consciousness with no real function (Vygotsky, 1962). Challenging this analysis, Vygotsky performed several experiments proving that monologue is not "individual speech". "If egocentric speech is from a lack of socialization, then the less the opportunity for social contact, the greater should be the amount of egocentric speech." Observing children alone, with other children, and with adults, Vygotsky found that children talk the *least* to themselves in a problem-solving situation when they are alone and there is no possible illusion of social exchange; they used the most "egocentric speech" with an unfamiliar adult present. When obstacles to the activity were set up, monologue increased even more. Vygotsky's conclusion is that "egocentric speech" is really social, arising from the desire of children to work with adults. When the adult is not familiar enough for the child to get direct help from him in completing a problem, the child carries on a dialogue with himself to try to imagine what help that adult might give. The functions of monologue are to plan action, and to formulate the problem in the case of obstacles. Egocentric speech occurs when the child transfers the social forms of speech he has learned to inner personal functions, and is an integral part of the development of his thought processes. It helps him learn to solve problems for himself; in a later stage of development, it becomes inner speech. Thus Vygotsky sees development moving in an opposite direction to Piaget's theory: from social to individual speech (El'konin, 1958).

Experiments by A. M. Levshina also showed that egocentric speech is not a simple function of maturation. The child's first speech is synpraxic; the meaning of an utterance is dependent on the situation; but even this speech is directed toward another person and is social in function. According to Levshina's findings, speech evolves from synpraxic to "contextual" speech, in which meaning is revealed in the context of the utterance itself. This more complex form of speech cannot occur until the acquisition of grammar, which allows for the organization of speech (El'konin, 1958). Luria's experiment with the twins also attests to the fact speech cannot fulfill any other function than an accompaniment to action until a certain level of mastery of language is achieved. Only after acquiring a minimal knowledge of grammar could the twins use speech in narration and description and in planning future activity (Luria, 1959).

Since synpraxic speech is the simplest use of language, situational opportunities for speech communication in which meanings are partly determined by the external situation should constitute the first phase in practicing a foreign language. Only later, after grammatical structures have been learned, should the student be required to use language for the more complex tasks of describing, narrating, and planning.

One of the most researched aspects of the relation of language and

thought is the work on "generalization". Again taking the developmental point of view, Vygotsky sees the following stages. First, a word designates a "heap" of objects, grouped by chance. Asked to find all "cubes", the child picks out those objects closest at hand or simply randomly. The second stage is thinking in "complexes". Here, objects are associated under one name by real perceptual bonds, usually a single attribute. For example, blocks of a similar size may be grouped, or blocks of one color. The child may pick out all the triangles from a group at this stage, but his choice will be based on perceptual similarities, not on an understanding of the concept "triangle". Asked to describe the objects chosen, he will not be able to say that they all have three sides. Often then, a child and an adult will use the same word to name the same object; however the *meaning* of the word will not be the same for the child and the adult. True concept formation, typical of adult thinking, abstracts out common elements; similar objects are grouped according to a remembered system of attributes. (Vygotsky, 1962). Complex thinking establishes relationships between objects. For example, a child and an adult may see a dog and say "dog", but while the adult means a specific type of four-legged animal, the child may simply mean "something plushy."

Another way of talking about the development of thought processes is in terms of the first and second signal systems. The use of words differs in children and adults in that, initially, the word is part of the first signal system. The spoken word is an auditory stimulus causing a conditioned reflex just like any other external stimulus. When the adult names an object, usually accompanying his speech with gestures, the child has an orienting reaction toward the object named (Raevsky, 1958). Or, if asked to name a certain object, the child is rewarded for the correct word, this is still part of the first signal system. The second signal system is not operating until the child learns to react not to the sound but to the *meaning* of a word. This occurs when the child will not only name an object after being shown it or speak out of an emotional reaction, but will *voluntarily* produce words. He will talk before being shown an object when he wants it, or when he wants to evoke a reaction in the adult. (Raevsky, 1958). This occurs during the second year.

However, the second signal system is not suddenly acquired but also goes through developmental stages. In the two and three year old, the second signal system is not strong enough to overcome kinesthetic reactions. In one experiment, children were told to press a rubber bulb on a red light but not on green. The excitement of pressing the rubber bulb is too strong to be inhibited by verbal instruction. The child impulsively presses on both red and green, and does not see his mistake (Luria, 1963). In older children of about five, they verbalize the rule and follow it without being distracted by kinesthetic elements. Another experiment conditioned children of various ages to respond to a loud bell (first signal system), and then paired the bell with the statement, "There is no bell." In younger children, the response was not affected by the verbal statement; but the older the child, the greater was the inhibition of the response when the stimulus was verbally denied (Slobin, 1966, p. 383). At this age when speech stimuli can *regulate* external stimuli, the second signal system is fully

operative; the ability to use speech in this way is a uniquely human phenomenon.

In terms of neural connections, the second signal system is characterized by a special type of connection that is formed in an abrupt fashion. This type of connection underlies all human intelligent behavior. In animals and babies, conditioning requires many repetitions of a "stimulus-response", constant reinforcement is necessary. Using words, a response can become strong in a single trial (Luria, 1969).

Soviet research on the relationship between language and thought points up the fallacy of a too direct application of the ways children learn to speak to the second language learning situation of adults. Children's acquisition of language is part of a maturational process, and part of their process of mental development in which their mode of thinking is completely different in quality as well as in quantity from that of adults.

Language is acquired through the need for communication, through maturation of the nervous system, in an intimate interrelationship with the development of thought, and through adult instruction. Another aspect of Luria's experiment with the twins was to study the effect of speech instruction on speech acquisition. After the twins were separated, only one of the twins was given speech training. He spent time with an adult every day and was made to answer questions, to name objects, to repeat complete sentences, and to describe pictures. After 3 months, his synpraxic speech had dropped by 50% as compared with 28% for the untrained twin. After 10 months, the untrained twin caught up as far as percentages of synpraxic to narrative and planning speech, but the trained twin used more different kinds of sentence constructions and his sentences were more grammatical (Luria, 1959).

This situation is more analogous to foreign language learning than is first language acquisition in the normal child, in which maturational processes are also at work. Both the twins and the foreign language student are physically and intellectually capable of learning a language. Luria's study refutes the extreme view that students should be allowed to say anything anyway that they please, and that their own innate knowledge about language will see them through. Instruction by an adult clearly hastens the learning process.

In a study of the influence of instruction on concept formation, Vygotsky found that taught knowledge differs from that acquired through experience. Spontaneous concept formation is non-reflective whereas "scientific" or schooled concept formation is deliberate. Again, a dialectical relationship is seen to operate between development and instruction. Scientific concepts cannot be formed before the child has unconsciously learned to generalize; spontaneous concepts cannot become conscious until he has been *taught* to systematize his thoughts. Vygotsky draws a parallel between the relationship of spontaneous and scientific concept formation to the relationship between first and second language learning. First language learning is spontaneous and largely non-reflective. In second language learning, awareness about the language precedes the ability to produce speech spontaneously; but only after learning a second language does one become fully aware of one's native language. The two develop

in reverse directions, each influencing and benefitting the other (Vygotsky, 1962). This observation is a good argument for the use of Contrastive Analysis as a method of foreign language teaching.

Child acquisition of language: linguistic studies

Apart from the psychological studies, there are a lot of linguistic data on the acquisition of Russian as an native language that can be useful to the teacher of Russian as a second language. Many studies have been made of the order in which Russian children learn the various cases, prepositions, rules for gender agreement, and so forth. Results have shown that child speech is not an imitation of adult speech, but has a structure of its own. As one would expect, the child learns gross distinctions (in terms of both meaning and sound) before sub-dividing these into finer categories. For example, in learning noun classes, the feminine nouns ending in accented -a are learned first, then the masculine ϕ stem nouns, then the soft-ending nouns, and last the unaccented neuter -o ending nouns. The accusative case as direct object is learned first, then the genitive of possession, then the dative as motion toward, the instrumental of action, and the prepositional of place. It is not until 6 months later that the genitive of negation is learned (El'konin, 1958). Perhaps studies of this nature can be used in helping to decide the order of presentation of new grammatical material in foreign language teaching. Like the child, it would be easier for the student of a language with strange sounds to learn gross differences of sound and usage before being presented with the finer points. The native child's perception can be used to help us know which aspects of grammar are immediately obvious and which take even the native a long time to learn. For example, we expect the student to master the use of prepositions and the various cases each one governs in the first year of foreign language study, whereas in a recent Soviet study it was shown that native Russians have difficulty with prepositions until adolescence (Slobin, 1966, p. 367).

Conclusion

Soviet studies open up a whole new perspective on psycholinguistic problems. It is important for the American psycholinguist to know these studies first, because in the search for language "universals", a study of English alone will not suffice. Besides, one of the defects of American research on child acquisition of language is that it is most often done in a naturalistic setting and fails to take an experimental approach. (Carroll, 1961). Experimental evidence from Soviet studies proves that there is nothing magical about language acquisition. The ability to use language is "innate" only in that it reflects a further evolution of the animal brain, characterized perhaps by the fact that neural connections of the abrupt type (2nd system) can be formed. The much vaunted "feeling for language" that children have is nothing more than a simple orientation to the sound form of words, often caused partially by the instructive guidance of the adult (El'konin, 1958). Arising from a different philosophy and oriented toward different goals, Soviet "materialistic psychology" has yielded some valuable insights into the problem of the acquisition of language by children.

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The Output of Canadian Universities as Measured by Graduate Degrees

This paper presents the results of a study on the output of universities. The aim was to determine a homogeneous unit of graduate degrees granted by each province in proportion to the labour force, that is, to compare the graduate degrees/labour ratios (1) between Quebec and the other provinces and (2) between the French and the English universities in Quebec. The basic idea is that graduates represent a stock of human capital of benefit to the different provinces. A weighting index was calculated for the different university degrees, based on the years of schooling required for each degree. On the basis of graduate degrees/-labour force ratios it seems that Ontario has surpassed the other provinces in the output of highly qualified manpower. With regard to Quebec, it seems that the French universities have not yet attained the breadth of research and scientific training that doctoral level programs should include.

Higher education in Canada has seen an increase in student enrolments at an annual rate of ten to fifteen per cent during the past decade. In addition, the rate of expenditure for this level of education has vastly surpassed the rate of personal income, making higher education a major industry.¹ It has been estimated that activities related to universities and colleges in Canada now account for about five per cent of aggregate national economic activity.² This fact has led us to study the output of Canadian universities, as measured by graduate degrees conferred or by graduates produced, the latter representing a stock of human capital of benefit to the different provinces.

Aim of the Study

This paper presents the results of a study on the output of universities. The aim of the study was to determine a common unit of graduate degrees granted per province in proportion to the labor force, that is, to compare the graduate degrees/labor force ratios (1) between Quebec and the other provinces and (2) between the French-language and the English-language universities in Quebec.

The Problem

The problem is formulated as follows: (1) Do Quebec universities train enough qualified manpower in comparison with the other provinces? (2) Encouraged by funds, and by the Quebec government policy of catching-up (*la politique de rattrapage*), did the French universities reach the output of the English universities in the province?

Conceptual Framework

The output of universities is linked with qualified labor requirements. The present unbalanced cycle of demand for and supply of professional manpower should lead the universities to diversify their programs of study and adjust to the rapidly changing labor market and social conditions. Of course, no one doubts the need for the qualified training offered by universities. In its First Annual Report, the Economic Council of Canada emphasized that the availability of highly qualified manpower will be a very important factor in reaching economic objectives in years to come.³ Between 1956 and 1963, Canada granted only one doctorate degree for every thirty-three conferred in the United States, even in proportion to their respective populations. And despite the increase in student enrolments in humanities and in social sciences these last years, not one doctorate was granted in Fine Arts, Library Sciences, or Physical Education in Canada until 1969; further, not one Ph.D. in Economics was awarded in the French universities in Quebec until 1970-71, even with the catching-up policy. It is thus at the graduate level of studies that the question of training highly qualified manpower becomes critical.

Graduate schools are engaged in two major throughput activities: instruction and research. The latter produces more knowledge and at the same time makes a better use of the already existing knowledge. Since it is difficult to quantify the amount of research done in a university (the sum of money invested in research during a certain period can be documented or the ratio of publications to faculty members can be fixed, but that is not enough to measure this throughput), this study assumes that there is no graduate school worthy of the name without some research activity. Hence, the university output on the master's level and particularly on the doctoral level implies research activity and applied scientific training.

This study limits itself to the graduate level for the following reasons:

1. Significant differences do not seem to exist among Canadian universities in the offerings and output of bachelor degree programs. The annual registrations in universities have increased during the last decade, and student enrolment projections for the years to come show a continuation of that increase.⁴ The decrease in birthrate observed in most of the provinces will probably be neutralized by the growing request for university instruction. It even seems that the disparities in taking university studies between sons of well-to-do families and those not so well off have decreased.⁵
2. A fact that strikes a higher education analyst is that the importance once given to first university degrees is reserved today for graduate degrees. In a good number of professions, the first university degree holders are

considered only as technicians, and a master's degree is the minimum requirement for reaching a more important position.

3. It is at the graduate level that we can perceive differences in the university teaching and research activities and in the diversification of programs based on technological innovations. The training of highly qualified manpower is subject to this type of scientific diversification.

Do a master's of 1960 and one of 1970 reflect the same quality? This is a difficult question, and no ready answer suggests itself. Nonetheless, a certain logic implies that a degree granted in 1970 would be of higher quality than one awarded in 1960 if only because of the increased quality of the input and the improvement of the throughput (better trained teachers, improved teaching methods, the use of technological innovations, the accumulation of more knowledge by research) during this period. In any case, it seems that the quality of instruction is changing, and so are the individual and social benefits that derive from the formation of human capital. These things not being quantifiable, to assume a constant average quality of the student body by discipline seems reasonable.⁶ Thus, the study does not carry a judgment on the value of the degrees granted.

Method

The period covered is 1960-61 to 1969-70, which was the period of expansion of higher education in Canada. University degrees were examined as a whole without differentiating between men and women, even though certain graduates, especially women, will work part time or may not join the labor force at all. The data on graduates and the labor force were taken from annual publications of the Dominion Bureau of Statistics (D.B.S.), although for the interpretation of degrees granted in Quebec, statistics from the French universities were considered.⁷

In order to establish a relation with the structure of professions that are found in the labor market, a distinction was made between Education, the Humanities, the Arts, and part of Social Sciences on one hand and the Biological Sciences, Engineering, Mathematics, Physics, and the Health Professions on the other. Degrees in Economics, Administration, Urbanism, and Planning, although being part of the Social Sciences, were added to the applied sciences. This differentiation is in line with the new standardized classification used by the D.B.S., which presents the statistics by disciplines and professions rather than by university and subdivision in Arts and Sciences. In other words, a distinction was made between "economic" graduates (those who by their integration in the labor force will contribute to the economic growth of the country) and the "cultural" or the "humanities" graduates (those who will participate only indirectly in the economic development). This distinction affects the breakdown of the student body holding a master's degree only, because very few graduates in Canada received a Ph.D. in economics or in the administrative sciences during the period studied.

Since 1968-69, "licences" have been included in the undergraduate level as equivalent to a bachelor's degree. The French universities have joined the other North American universities by granting B.A., M.A., and Ph.D.'s. The "licences" that follow a degree in the same field of study are counted

TABLE 1
GRADUATE LEVEL DEGREES GRANTED BY CANADIAN UNIVERSITIES

Year	D.	Atlantic Provinces						Quebec						Ontario	
		Hum.	Sc.	Total	W.	U.D.	T.U.	Hum.	Sc.	Total	W.	U.D.	T.U.	Hum.	Sc.
1960	L.	-	-	-	-	-	-	301	62	363	0.7	254		59	
-61	M.	68	38	106	0.8	85		288	381	669	0.8	535		401	428
	D.	-	3	3	1	3	88	39	84	123	1	123	912	56	89
	L.	-	-	-	-	-	-	453	88	541	0.7	379		83	
1961	M.	57	37	94	0.8	75		307	370	677	0.8	542		452	481
-62	D.	-	8	8	1	8	83	35	71	106	1	106	1027	47	97
	L.	-	-	-	-	-	-	460	103	563	0.7	394		32	
1962	M.	75	65	140	0.8	112		330	430	760	0.8	608		510	536
-63	D.	-	3	3	1	3	115	33	93	126	1	126	1128	62	122
	L.	-	-	-	-	-	-	444	103	547	0.7	383		62	
1963	M.	86	89	175	0.8	140		344	401	745	0.8	596		626	624
-64	D.	1	5	6	1	6	146	46	112	158	1	158	1137	65	123
	L.	-	-	-	-	-	-	569	111	680	0.7	476		55	
1964	M.	107	101	208	0.8	166		288	525	813	0.8	650		778	752
-65	D.	-	14	14	1	14	180	54	121	175	1	175	1301	80	147
	L.	-	-	-	-	-	-	1031	70	1101	0.7	771		38	
1965	M.	120	99	219	0.8	175		294	694	988	0.8	790		908	970
-66	D.	2	15	17	1	17	192	47	124	171	1	171	1732	109	207
	L.	-	-	-	-	-	-	1180	72	1252	0.7	876		53	
1966	M.	130	106	236	0.8	189		453	766	1219	0.8	975		1213	1198
-67	D.	1	22	23	1	23	212	80	147	227	1	227	2078	103	230
	L.	-	-	-	-	-	-	1412	278	1690	0.7	1183		3	
1967	M.	160	146	306	0.8	245		660	612	1272	0.8	1018		1376	1377
-68	D.	3	18	21	1	21	266	69	160	229	1	229	2430	164	321
	L.	-	-	-	-	-	-	193	254	447	0.7	313		5	
1968	M.	162	190	352	0.8	282		633	740	1373	0.8	1099		1693	1570
-69	D.	1	36	37	1	37	319	79	157	236	1	236	1648	164	340
	L.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	M.	240	185	425	0.8	340		962	872	1834	0.8	1467		2277	2058
-70	D.	4	42	46	1	46	386	79	181	260	1	260	1727	137	503

For key to abbreviations see page 125.

TABLE 1 (contd.)
GRADUATE LEVEL DEGREES GRANTED BY CANADIAN UNIVERSITIES

Ontario (contd.)				Western Provinces						Canada					
Total	W.	U.D.	T.U.	Hum.	Sc.	Total	W.	U.D.	T.U.	Hum.	Sc.	Total	W.	U.D.	T.U.
59	0.7	41		-	-	-		-		360	62	422	0.7	295	
829	0.8	663		167	281	448	0.8	358		924	1128	2052	0.8	1642	
145	1	145	849	2	32	34	1	34	392	97	208	305	1	305	2242
83	0.7	58		-	-	-		-		536	88	624	0.7	437	
933	0.8	745		201	312	513	0.8	410		1017	1200	2217	0.8	1773	
144	1	144	947	9	54	63	1	63	473	91	230	321	1	321	2531
32	0.7	22		-	-	-		-		492	103	595	0.7	417	
1046	0.8	837		270	356	626	0.8	501		1185	1387	2572	0.8	2058	
184	1	184	1043	5	102	107	1	107	608	100	320	420	1	420	2895
62	0.7	43		-	-	-		-		506	103	609	0.7	426	
1250	0.8	1000		367	364	731	0.8	585		1423	1478	2901	0.8	2321	
190	1	190	1233	4	127	131	1	131	716	116	369	485	1	485	3232
55	0.7	39		-	-	-		-		624	111	735	0.7	515	
1530	0.8	1224		418	397	815	0.8	652		1591	1775	3366	0.8	2693	
227	1	227	1490	13	140	153	1	153	805	147	422	569	1	569	3777
38	0.7	27		-	-	-		-		1069	70	1139	0.7	797	
1878	0.8	1503		464	547	1011	0.8	809		1786	2310	4096	0.8	3277	
316	1	316	1846	23	170	193	1	193	1002	181	516	697	1	697	4771
53	0.7	37		-	-	-		-		1233	72	1305	0.7	914	
2408	0.8	1927		579	506	1085	0.8	868		2375	2573	4948	0.8	3958	
333	1	333	2297	25	180	205	1	205	1073	209	579	788	1	788	5660
3	0.7	2		4	-	4	0.7	3		1419	278	1697	0.7	1188	
2753	0.8	2203		665	621	1286	0.8	1029		2861	2756	5617	0.8	4493	
485	1	485	2690	45	226	271	1	271	1303	281	725	1006	1	1006	6687
5	0.7	4		-	-	-		-		198	254	452	0.7	316	
3263	0.8	2610		708	703	1411	0.8	1129		3196	3203	6399	0.8	5119	
504	1	504	3118	84	247	331	1	331	1460	328	780	1108	1	1108	6543
-	-	-		-	-	-		-		-	-	-		-	
4327	0.8	3462		1022	853	1875	0.8	1500		4501	3960	8461	0.8	6769	
640	1	640	4102	99	330	429	1	429	1929	319	1056	1375	1	1375	8144

as the equivalent of a master's. In order to do justice to the teaching activities in the French universities, this study considers the "licences" as being above the bachelor's during the period in which they were counted in the master's.

Honorary doctorates are excluded, as are doctorates in dentistry and medicine, the latter being a first professional degree. Also excluded in this study are the diplomas and certificates awarded for courses of study sanctioned by a diploma or certificate, since their programs of study differ from those leading to a degree. While acknowledging that the Ph.D. is not the only quality indicator and that there are other titles than the doctorate degree in certain university disciplines and fields of study, the present study examined the M.A., M.Ed., M.Sc., Ed.D. and Ph.D. degrees only.

In order to determine a composite output measure or a common unit of degrees granted per province, a weighting index is calculated for the different university degrees, based on the years of schooling required for each degree. Hence, the weight of 0.7 units is calculated for a "licence" (seventeen years of schooling), 0.8 units is counted for a master's (eighteen years of schooling) and one unit is calculated for a doctorate (twenty years of schooling).⁹ The summation gives us a yearly total of units of degrees granted or of graduates produced per year in Canada as a whole, and also per province and regional groupings.

Table 1 presents data on degrees granted by Canadian universities. The Atlantic Provinces (New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island), Quebec, Ontario, and the Western Provinces (Alberta, British Columbia, Manitoba, Saskatchewan) form geographical or regional units, facilitating the comparison. This subdivision is also used in the publications of the D.B.S. Table 2 presents totals of the labor force for the month of October of each year. The annual list of graduates includes the graduating classes of May and October; thus, for statistical reasons, the active labor force report for the month of October of each year seems the best to use.

Data Analysis

"Licences" were awarded by the French universities in the province of Quebec and a number of them by the bilingual University of Ottawa. As mentioned beforehand, the decrease in number in 1968-69 is attributed to the fact that the "licences" were included at the undergraduate level as equivalent to a bachelor's degree and that the programs of study were restructured in view of the master's. Most "licences" were awarded in the humanities. The turning point was 1965-66, when 1,101 "licences" were granted in Quebec, as compared to 680 the preceding year. Probably, this was the result of the university catching-up policy brought about in the early 1960's. The fact that the master's replaced the "licence" can be seen in 1969-70, when 1,834 masters were conferred, as against 1,373 in 1968-69.

In the country as a whole, the number of degrees granted in the humanities increased each year (see Table 1, column Canada). From 1,381 master's awarded in 1960-61, the number grew to 4,820 in 1969-70; the number of degrees in sciences increased from 1,398 in 1960-61 to 5,016 in 1969-70.

TABLE 2

GRADUATE LEVEL DEGREES-LABOR FORCE RATIOS

Year	Atlantic Prov.			Quebec			Ontario			Western Prov.			Canada		
	U.D.	L.F.	R.	U.D.	L.F.	R.	U.D.	L.F.	R.	U.D.	L.F.	R.	U.D.	L.F.	R.
	(1)	(2)	(1)/(2)	(1)	(2)	(1)/(2)	(1)	(2)	(1)/(2)	(1)	(2)	(1)/(2)	(1)	(2)	(1)/(2)
Oct. 1961	88	613	0.144	912	1812	0.503	849	2386	0.356	392	1727	0.227	2242	6538	0.343
Oct. 1962	83	608	0.137	1027	1839	0.558	947	2403	0.394	473	1759	0.269	2531	6609	0.383
Oct. 1963	115	613	0.188	1128	1930	0.584	1043	2487	0.419	608	1811	0.336	2895	6841	0.423
Oct. 1964	146	622	0.235	1137	1938	0.587	1233	2546	0.484	716	1856	0.386	3232	6962	0.464
Oct. 1965	180	625	0.288	1301	2040	0.638	1490	2596	0.574	805	1918	0.420	3777	7179	0.526
Oct. 1966	192	638	0.301	1732	2149	0.806	1846	2740	0.674	1002	1992	0.503	4771	7519	0.635
Oct. 1967	212	653	0.325	2078	2181	0.953	2297	2815	0.816	1073	2042	0.525	5660	7691	0.736
Oct. 1968	266	650	0.409	2430	2241	1.084	2690	2961	0.908	1303	2143	0.608	6687	7995	0.836
Oct. 1969	319	659	0.484	1648	2290	0.720	3118	3002	1.039	1460	2191	0.666	6543	8142	0.804
Oct. 1970	386	668	0.578	1727	2335	0.740	4102	3137	1.308	1929	2272	0.849	8144	8412	0.968

Abbreviations: Table 1

D. = Degree
L. = Licence
M. = Master
D. = Doctorate

Hum. = Humanities
Sc. = Sciences
W. = Weighting index
U.D. = Units of Degrees
T.U. = Total Units

Abbreviations: Table 2

Prov. = Provinces
U.D. = Units of Degrees
L.F. = Labor Force in thousands
R. = Ratios of column 1/column 2

On the basis of graduate degrees-labor force ratios (see Table 2), it seems since 1968-69 that Ontario has surpassed the other provinces or groups of provinces in the output of graduates, although Quebec came first until 1967-68. In October 1970, the ratios were 1.308 units of graduates per thousand members of the labor force in Ontario, 0.849 units in the Western Provinces, 0.740 in Quebec, and 0.578 in the Atlantic Provinces. Quebec is even behind the Western Provinces; the effort of the latter in higher education seems to have increased significantly.

It might be that the compilation of "licences" at the undergraduate level decreases the number of graduate degrees for Quebec in 1968-69 and 1969-70. However, if we take a look at the number of units for Ontario and for the Western Provinces, we can see the following: the progress in Ontario dates to 1966-67, before "licences" were considered as equivalent to a bachelor's. As to the Western Provinces, from 1967-68 their output in doctorates has been higher than that in Quebec; these provinces progressed from 1968-69 to 1969-70 by thirty-two per cent.

In part two of the present study, we will compare the French and English universities of the province of Quebec. In the output of master's, the French universities drew ahead of the English universities during the whole period. The situation is different in the output of doctorates. Here McGill University surpasses the French universities put together (see Table 3). Between 1960-61 and 1969-70, McGill granted 1,123 doctorates, while the French universities awarded only 687. Especially in sciences, McGill surpasses by far the other universities in the province. It granted 916 doctorates, while Laval University, the University of Montreal, and the University of Sherbrooke awarded all together 334 doctorates, or seventy-three per cent by McGill and twenty-seven per cent by the French universities.

Summary and Conclusions

Ontario and the Western Provinces have been ahead of Quebec in the graduate degrees/labor force ratio these past few years. As for the comparison in Quebec itself, the French universities produce now more master's than the English ones, but McGill surpasses all the French universities put together in the output of doctorates.

Now, if we return to the principle noted beforehand, that the output of graduates, and particularly of doctorates, implies research activity and applied scientific training, Ontario and the Western Provinces surpass Quebec in the training of a highly qualified manpower needed for economic growth. One can say that Ontario is becoming the university research center of Canada.

With regard to Quebec, it seems that a good number of Ph.D.'s from McGill do not integrate in the economy of the province. Is this because of the graduate student population composition of that university (a significant number is made up of foreign or out-of-the-province students), or is it by the nature of circumstances (the French fact in Quebec)? If this is so, the problem of training a highly qualified manpower for this province becomes even more serious.

As for the catching-up policy set for the French universities, it seems

TABLE 3
EARNED DOCTORATES GRANTED BY QUEBEC UNIVERSITIES

McGill			Laval			U. of M.			M.D.C.			U. of Sh.			Quebec			
Year	H.	Sc.	T.	H.	Sc.	T.	H.	Sc.	T.	H.	Sc.	T.	H.	Sc.	T.	H.	Sc.	T.
1960-61	9	65	74	10	6	16	20	13	33	—	—	—	—	—	—	39	84	123
1961-62	16	54	70	4	3	7	15	14	29	—	—	—	—	—	—	35	71	106
1962-63	11	72	83	7	10	17	15	11	26	—	—	—	—	—	—	33	93	126
1963-64	18	87	105	9	9	18	19	16	35	—	—	—	—	—	—	46	112	158
1964-65	25	106	131	13	7	20	16	8	24	—	—	—	—	—	—	54	121	175
1965-66	18	88	106	16	17	33	13	19	32	—	—	—	—	—	—	47	124	171
1966-67	27	96	123	22	21	43	30	30	60	1	—	1	—	—	—	80	147	227
1967-68	29	130	159	16	12	28	24	17	41	—	—	—	—	1	1	69	160	229
1968-69	25	99	124	18	29	47	36	25	61	—	—	—	—	4	4	79	157	236
1969-70	29	119	148	20	26	46	30	32	62	—	—	—	—	4	4	79	181	260
Total	207	916	1123	135	140	275	218	185	403	1	—	1	—	9	9	561	1250	1811

Abbreviations:

- U. of M. = University of Montreal
- M.D.C. = Montreal Diocese College
- U. of Sh. = University of Sherbrooke
- H. = Humanities
- Sc. = Sciences
- T. = Total

that the latter have not yet attained the breadth of research and scientific training that doctoral level programs should include.

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6. Hettich, *op. cit.*, p. 60, asserts that applying adjustments to the measure of output, that is, to the quality of the student body, requires the same adjustments to the earnings foregone, which comes to the same.
7. *Survey of Higher Education*, D.B.S., Cat. 81-211, Part II, Degrees and Summary, 1959-61 to 1968-69; *Degrees, Diplomas, Certificates Awarded by Degree-Granting Institutions 1969-70*, Cat. 81-211; Université Laval, "Statistiques des diplômes de l'Université Laval," 1960-61 to 1967-68 (mimeographed); *Statistiques* 1969-70 and 1970-71; Université de Sherbrooke, *Statistiques* 1967-68 to 1970-71; Université de Montreal, *Statistiques* 1967-68 to 1970-71.
8. D.B.S., *Degrees, Diplomas, . . .*, p. 101 Zsigmond & Wenaas, pp. 275-76.
9. The Quebec teachers' collective agreement for 1967-68 mentions in an Appendix the recognition of degrees granted by different Canadian, North American, and French degree-granting institutions in terms of school years; see also *University Affairs*, 1969, Vol. X (8), pp. 16-17.
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Alienation: Meaning, Origins and Forms

Although the concept of alienation has been used widely, few attempts have been made at its precise definition or measurement. In this article, the author takes the position that alienation manifests itself in many different forms depending on the object, origin and mode of its expression. To label all unconventional youth as "alienated" is to oversimplify the underlying reality. Major theories of alienation from various perspectives are reviewed and their common themes and characteristics relevant to the study of contemporary student alienation are discussed. Two major forms of contemporary student alienation are identified: a retreatist passive form termed "psychological alienation", and an active radical form termed "active political alienation". It is claimed that these two forms are different in nature, origin and scope, involving estrangement from essentially different objects. A model and certain hypotheses related to different forms of alienation are suggested. It is argued that in spite of the attention political activist students have received recently, it is the passive conforming form of alienation which warrants greater attention.

Introduction

In recent years, the term alienation has been used extensively to characterize certain types of reaction to the stresses and strains of contemporary technological society. It has been used both to condemn the dissenter who refuses to support the values and structures of modern society, and the conformist, who over-conforms and follows exactly the socially prescribed behavioral norms but whose actions bring no personal meaning or fulfillment. The term has become so commonplace both in popular and professional usage and yet remains so nebulous that few can agree on its precise definition.

Yet it has become a platform slogan with politicians, an empirical question with academicians, and an area of great concern for the public. In everyday discourse it is said that children are alienated from parents, youth from society and people from government. Ecologists tell us that man is alienated from nature and our theologians and philosophers warn

us that we are alienated from our spiritual-essence. Josephson and Josephson (1962) call it a central problem of our time.

The term alienation has been applied to those who deliberately reject society and its institutions (Keniston, 1965) and those who are rejected by society (Marx, 1964). Some have used it to refer primarily to undesirable social and moral conditions (Durkheim, 1951; Merton, 1957); others have characterized it in terms of personal disintegration or identity diffusion (Erickson, 1959, 1968; Feuer, 1969b; Fromm, 1955, 1965). A few maintain that individual alienation may be an outgrowth of an individual's inability to cope with contemporary social and cultural demands and his earnest desire to invest his released energies to bring about the necessary social and cultural reconstruction (Becker, 1967; Flacks, 1967; Keniston, 1968).

Keniston has rightly stated:

All of this makes discourse about alienation difficult. Indeed, one would be tempted to abandon the concept altogether were it not for the certainty that the same problems of definition would then crop-up again with some cognate term like estrangement, disaffection, or detachment. Ambiguous terms suggest vague thinking which requires sharper distinctions—and not merely a new and equally vague synonym. (pp. 452-53).

Meaning of Alienation

In a general sense, alienation refers to feelings of estrangement or disaffection. A common assumption that is made in most usages of the term is that some natural, desirable relationship which once existed has ceased to exist. The underlying message invariably is that something is wrong somewhere and something needs to be done either to restore the lost connection or replace it with some other meaningful relationship.

Although alienation connotes general feelings of apathy and despair, nevertheless, the objects of alienation may differ: self, others, society and its institutions, so may the origins and the forms in which it manifests itself. The forms may differ primarily in subtle variations: powerlessness, meaninglessness, isolation, pessimism, repudiation, dejection, etc.

It follows from the above that the varieties of alienation are as many as are its objects and sources and to lump all these types together under a common label of "alienation" is to over-simplify the underlying reality. As Keniston (1965) has pointed out, it is important not only to specify precisely what we mean by alienation in a particular context but also to consider the following properties in its definition:

1. Alienation from what: or who is the object of alienation?
2. What form alienation takes: does it merely imply indifference or passive rejection of existing social and cultural norms as in the case of "hip-cult" or does it imply vehement opposition, or even open hostility, as in the form of anti-Vietnam War demonstrations?
3. Identify the mode in which it is manifested: is it an attempt on the individual's part to transform society, or is it an attempt towards self-transformation?
4. And finally, is alienation self-chosen or imposed? It is quite conceivable that these two forms are related: the person may reject those who have rejected him. But in many instances they are unrelated: for example, the Black Bourgeoisie accepts the norms of the white society from which it is excluded. (pp. 453-55).

TWO SCHOOLS OF THOUGHT

Before we attempt to define contemporary student alienation and analyse it on the above lines, it seems appropriate to present a critique of the different perspectives from which the concept has been studied in the past.

There are two major schools of thought in this area. The sociological point of view sees alienation as a *social problem*; a reaction to the stresses, inconsistencies and injustices of the social system. The alienated man is said to be the victim of his society; his alienation is imposed upon him by an unjust social order. Under this tradition, the role of individual personality and personal pathology is largely ignored.

The psychological theory of alienation, on the other hand, views it as developmental in nature, and traces its root cause to "*personal*" pathology. This tradition regards the individual as a victim of early childhood experiences and patterns of family relationships. The alienation of the individual is self-chosen and serves as a refuge from painful inter-personal relationships.

Each of these schools, however, has limitations. The psychologist overlooks the social reality which shapes individual lives; the sociologist ignores the importance of human experiences. The fact is that these both kinds of factors, and many others, are simultaneously at work.

In what follows, theories of alienation are considered from these two major perspectives: the sociological perspective (Durkheim, Merton, and Marx) and the psychological perspective (Erikson, Fromm, and Keniston).

Sociological Perspective

In sociological literature the term alienation may be traced to the words of *Emile Durkheim*, the French sociologist, who first used the term *anomie* to refer to a state of disturbance or normlessness in a collective order. By normlessness he means lack of consensus within the society about goals as well as behaviours expected of its members. This lack of consensus about values leads to the absence of societal "moral authority" operating over individuals.

According to Durkheim, two social variables—integration and regulation—jointly regulate suicide rates in a society. A society is said to be integrated to the degree to which its members possess a common conscience and manifest a sense of devotion to common goals. A high level of integration he calls *Altruism* and a low level *Egoism*. Extreme forms of altruism result in many suicides because it stresses individual renunciation. On the other hand, a high level of egoism may also cause suicides because it stresses individual self-interests rather than those of the collectivity. Between these two forms of integration lies a third social condition of moderate integration in which suicides are few (Durkheim, pp. 209-10 and 220-25).

By regulation, Durkheim implies the extent to which a society has moral authority or control over its members. He assigns the term *anomie* to a state of low regulation, where individuals are left to their own resources. In the absence of societal regulation, individuals become insecure and uncertain about themselves and their relationship to society. Such a state

leads to high rates of suicide. The other extreme where societal regulation is very high he calls *fatalism*. When a state of fatalism prevails, social regulation is intense: “. . . futures (are) pitilessly blocked and passions violently choked by oppressive disciplines.” (p. 276). In between these two extremes is a social condition where societal regulation is moderate and a consequent fewer number of suicides. Schematically, Durkheim’s ideas work out as follows:

TABLE 1
SUICIDE RATE UNDER VARYING SOCIAL CONDITIONS

		Integration →		
		Low	Moderate	High
Regulation ↓	Low	Egoism & Anomie Very High 1	Anomie High 2	Anomie & Altruism Very High 3
	Moderate	Egoism High 4	Inter-mediate Low 5	Altruism High 6
	High	Fatalism & Egoism Very High 7	Fatalism High 8	Altruism & Fatalism Very High 9

(American Sociological Review, 1965, p.878).

To Durkheim, societal stability that grows out of strong moral regulation is very important for controlling societal normlessness. When there is lack of social equilibrium, the individual has no means of self-regulation or sense of collective support. He may experience personal normlessness or anomia. (The term anomia is frequently used to refer to the individual sense of normlessness, whereas, anomie is used only to describe normlessness at the societal level). Individual anomia (alienation) may be defined in terms of states of mind which accompany social disintegration: feelings of normlessness, powerlessness, meaninglessness—feelings that frequently lead to suicide.

Societal disintegration may cause psychological anomia but it is important to note (as is clear from the above diagram) that societal over-

regulation may also lead to individual alienation though different in nature, that is, alienation which manifests itself in over-conformity or ritualism.

Robert Merton defines individual alienation “as a symptom of dissociation between culturally prescribed aspirations and socially structured avenues for realizing those aspirations” (Merton, 1957, p. 134). Merton considers such a dissociation prevalent in American society because culturally approved means for reaching the desirable goals—success and money—are not available to all its members. People, therefore, use illegitimate means to reach the primary goals. Merton maintains that dissociation is characteristic of American society as a whole, the nature and degree of the dissociation, however, are not equally distributed throughout the society; it is more visible among the lower classes than among those of the more privileged upper classes.

This hypothesis of differential pressure of goal-means disjunction on various social strata enabled Merton to identify five types of deviant behaviour (Table 2).

TABLE 2
TYPES OF DEVIANCE

	Cultural Goals	Institutionalized Means
1. Conformity	+	+
2. Innovation	+	-
3. Ritualism	-	+
4. Retreatism	-	-
5. Rebellion	±	±

NOTES: + = acceptance, - = rejection, ± = rejection and substitution,
(Merton, 1957, p. 140).

Individual conformity to societal goals and means is the most common adaptation in any society and is, in fact, a measure of its stability. Societies which fail to command conformity from their members cannot long survive.

Innovation is also very common. This response occurs when the individual has assimilated the cultural emphasis upon the goals without internalizing the institutional norms in terms of means for its attainment. Merton recognizes that the American culture makes incompatible demands on those located in the lower reaches of the social structure. On the one hand, they are asked to orient their conduct towards the prospect of wealth and on the other, they are denied effective opportunities to do so institutionally. The consequence of this structural inconsistency is a high rate of deviant behaviour among the lower classes.

Ritualistic forms of adaptation involve the acceptance of institutional means, but the abandonment of cultural goals, for example, of “getting ahead” in the world. We should expect this type of adaptation to be fairly frequent in a society which makes one’s social status largely dependent upon one’s achievements. If one should expect lower classes to exhibit

Adaptation II, i.e., innovation, the lower middle classes are heavily represented among those making Adaptation III—ritualism (what Fromm calls over-conformity).

Retreatism involves a rejection of both goals and means and is the least frequent form of deviance. People who choose this type of adaptation are, in the sociological sense, the true aliens. In this category fall some of the psychotics, chronic drunkards and drug addicts. They have given up on culturally prescribed goals and their behaviour is out of tune with institutional norms; they are in fact the most extremely psychologically alienated or anomic individuals in society.

Rebellion envisages a complete rejection of existing goals and structures and substituting new ones in their place. In rebellion, allegiance is withdrawn from the existing social structure because it is seen as a barrier to desirable goals. In order to engage in organized political action, allegiance must not only be withdrawn from the existing social structure but must be transferred to new groups committed to new ideologies.

Merton's analysis of alienation is similar to Durkheim's in that he considers the primary source of all alienation to be the anomic condition of the society. However, Merton analyzes the effects of alienation and anomie in terms of the structure of the social system and recognizes that social anomie has different effects on individuals occupying different positions within the structure.

Merton's theory about the social sources of individual alienation marks a significant contribution. Nevertheless it would be interesting to test the hypothesis that the incidence and degree of alienation are differentially distributed among different social classes. Alienation may be as widespread among the upper classes as among the lower classes. The nature of alienation may, however, be different. Among the lower classes it could be more external in nature, the object of alienation being society and its institutions; among the upper classes it could be more internal in form, consisting of feelings of isolation, depersonalization, doubt, etc.

The political theory of "alienation" is generally traced to the writings of *Karl Marx*, particularly to his early economic and philosophic manuscripts (also known as the Paris Manuscripts). Marx, in his theory, focuses primarily on the alienation of the worker which he traces to the economic and political policies of capitalism. His central thesis is that under capitalism, the worker has no control over the process or the product of his labour, and is therefore not able to produce what he considers to be an expression of his creativity: he creates a commodity which sells in the market. Work becomes merely a means to other ends, namely, wages and making a living, and loses any personal meaning or relevance for the worker. Furthermore, since the product the worker produces sells for more than he himself can afford to pay for it, he begins to deify the products of his own creation. In contemporary western world, this deification results in commercialism. Thus, the very product over which the worker once had control confronts him as an alien and a powerful thing, controlling his work motivation. This primary loss of relationship to his work results insidiously in the worker's estrangement from himself and his fellow workers.

According to Marx, alienation of the worker is not chosen but imposed upon him by the social system; its victims are usually unaware of the extent of their detachment from their work, themselves or fellowmen. Paradoxically, alienation begins to cease once the worker becomes aware of it: this awareness activates “class-consciousness” among the proletariat which pushes them to create a classless society where the worker is no longer alienated from his labour.

In Weber’s work, we find an extension beyond the industrial sphere of the Marxian notion of powerlessness. Of this extension, Gerth and Mills write:

Marx’s emphasis upon the wage worker as being “separated from the means of production” becomes, in Weber’s perspective, merely one special case of a universal trend. The modern soldier is equally separated from the means of violence; the scientist from the means of inquiry; and the civil servant from the means of administration. (1946, p. 50).

Psychological Perspective

The term anomie has been employed both in social and psychological contexts. However, it is important to note that social anomie and psychological anomie are theoretically different in scope and origins involving estrangement from essentially different objects (Nettler, 1957). In assessing social anomie, the individual’s feelings are measured with reference to the social system whereas psychological anomie is measured in terms of the individual’s feelings about himself.

Erikson’s concern with identity formation in adolescence and early adulthood stems from his theory about “ego-qualities” that emerge from critical developmental stages of life. He characterizes adolescence as a period of great stress for young people. The developmental crisis of this period centers around the issue of identity. Identity, to be sure, does not originate (and does not end) in adolescence: from birth onward, the child learns to identify with certain prototypes and to reject others. This process, however, becomes critical in youth when the ego is called upon to assimilate childhood identifications with the individual’s developed capacities. Thus “identity formation . . . arises from the selective repudiation and . . . assimilation of childhood identifications” (Erikson, 1968, p. 159). If successful, a coherent sense of who I am, what I can do, what meaning I assign to life develops.

An individual’s sense of identity is in part an outgrowth of his ability to assimilate dominant social practices with his individual identity development. In this way the concept embraces psycho-social character. Man’s “. . . psycho-social identity . . . depends on a complementarity of an inner (ego) synthesis in the individual and of role integration in his group” (1968a, p. 61).

Failure to integrate earlier identifications results in what Erickson terms “identity (role) confusion”, and a prolonged identity confusion deprives society of the devoted application of energies of youth.

Another way of focusing on an identity, which is not truly integrative, is a premature escape into the comforts of “negative identity”, or repudia-

tion of any identity. A negative identity remains an unruly part of the total identity. In addition, man tends to “make his own” the negative image of himself imposed on him by superiors and exploiters (1959, pp. 30-31). Erikson’s description of parents who foster such negative identity is as follows:

These mothers love, but they love desperately and intrusively. They are themselves so hungry for approval and recognition that they burden their young children with complicated complaints, especially about their fathers, almost pleading with them to justify their mother’s existence by their existence. They are highly jealous and highly sensitive to the jealousy of others . . .

The fathers although unusually successful and often outstanding in their fields do not stand up against their wives at home because of an excessive dependence upon them, in consequence of which the fathers also are deeply jealous of their children . . . (Erikson, 1968, p. 178).

The notable features of Erikson’s theory about “ego-formation” are ego strength, role integration, continuity, ideology, and commitment, the very ingredients Keniston found lacking in his “uncommitted” Harvard students.

Fromm in his analysis of the contemporary social character focuses primarily on man’s alienation from himself. His major thesis is that man has gained freedom *from* the dogmas of an earlier age but he has failed to use this freedom *to* realize his individual self. He has not learned to function and accept himself as he is, but plays a role for the benefit of others, i.e., he has become a psychologically alienated conformist.

Alienation means a mode of existence in which the person experiences himself as an alien. He has become, one might say, estranged from himself (Fromm, 1955, p. 120).

To be self-alienated, in the final analysis, means to be something less than one might ideally be if the circumstances in society were otherwise: to be insecure, given over to appearances, to overadapt to other’s wishes. David Riesman’s discussion of the “other-directed” fits in exactly with Fromm’s description of the psychologically alienated conformist:

For what is at stake is that the child learns that nothing in his character; no possession he owns, no inheritance of name or talent, no work he has done is valued for itself, but only for its effect on others (Riesman, 1950, p. 49).

Fromm would have an individual actualize his real-potentials in order to gain closeness and integration with himself and others, at a deeper and less arbitrary level.

Keniston’s theory of alienation is based on his research conducted on the alienated Harvard students (1965). While Keniston started with a social and cultural definition of alienation, his ultimate analysis turned out to be more psychological in nature. He defined these alienated intellectuals in terms of their “explicit rejection of what was seen as the dominant values of American culture” (Keniston, 1968, p. 326). The empirical cluster of attitudes termed the “alienated syndrome,” descriptive of these students, consisted inter alia of distress, pessimism, avowed hostility, interpersonal, social, and cultural alienation and vacillation.

Keniston traces the psychological alienation of his subjects to the patterns of family organization and interrelationships. The parents of the alienated seem to have been frustrated and disappointed with their

married life. "The mother's talents and emotionality found little expression with her marriage; the father's idealism and youthful dreams were crushed by the realities of his adult life" (Keniston, 1968, p. 337). The frustrations and disappointments experienced by parents were played out with, and over, their children.

The mothers sought in their sons the satisfaction they should have found with their husbands; they bound their sons to them with heavy ties of guilt and dependency. The fathers were seldom shown adequate; they were largely absent from their sons' psychological development. Moreover, these fathers suggested through deed and word that their sons should not become like them. The mothers not only fostered pathological attachment of their sons to themselves, but made them reject any positive identification with their fathers.

Keniston's description of his alienated students suggests that psychological alienation is an outgrowth of the son's tragic success in the oedipal conflict and of confused parental identification. Yet the disastrous victory of the sons in the oedipal conflict instilled in them a deep dislike of all rivalry and competition.

The above discussion on the theories of alienation leads to an important issue: is psychological alienation, as Marx would put it, a reflection of social reality or is the sociological alienation, as Freud would put it, a reflection of psychic contents? The answer perhaps is that both are true, depending on the locus of reality. The central question as Roszak would frame it is: which type of alienation is the real one, or which is the substance and which is the shadow? The following discussion on the contemporary student alienation may provide some partial answers to the above question.

CONTEMPORARY STUDENT ALIENATION

Definition

Contemporary *student alienation* may be defined as a pattern of behaviours or attitudes "freely" chosen by young people who explicitly reject what they perceive as the dominant values or norms of society. As Keniston has noted:

. . . the alienated are different from their non-alienated friends; they differ not in what they do but in how they do it. Alienation expresses itself most characteristically as a style of life, a special attitude brought to ordinary activities, a special relationship to the crucial events of one's life (Keniston, 1965, p. 86).

Typology of Alienation

Contemporary student alienation expresses itself in two major forms: a passive retreatist response, the defining feature of which is withdrawal from and rejection of traditional social values, norms and institutions (for example, the hippie sub-cultures); and a more active radical response, the defining characteristic of which is participation in a demonstration or group activity that concerns itself with some political, social or ethical principle (for example, student political movements).

These forms of contemporary alienation puzzle many people insofar as

the youth most involved do not seem to be the type one would expect to be alienated. Almost every objective study has shown that these young people come from economically privileged, professional and educated families. They are endowed with superior intelligence, high talents and healthy bodies (Katz, 1965, Peterson, 1966, Mehra, 1971). Their grievances against the society appear to be based on no socio-economic deprivation (as described by Merton and Marx). In this sense their alienation cannot be explained by simple social hardships.

The "stereotype" of alienated youth, as commonly described, is both a "Bohemian" and a "political activist." In appearance he is bearded, long-haired, dirty and unkempt, and comes across as profoundly disenchanted with society. He is popularly portrayed as an experimenter in Zen and drugs and unconventional in his daily behaviour and life style. He is described as personally frustrated and unhappy, often deeply maladjusted as a person and a failure in life.

Sources

The sources of alienation are generally traced to the loss of certain traditional values. A common assumption invariably made is that the breakdown of family life, high rates of divorces, softness of modern living and above all parental over-indulgence and spoiling have contributed to the prevalence of youth alienation. It is said that these dissenters, brought up in undisciplined homes by parents unsure of their own values and philosophies, are playing out their frustrations and anger against the older generation, against all authority, and against most established institutions (Keniston, 1968, p. 299).

Similar arguments are found in the writings of some contemporary scholars. *Lewis Feuer* (1969) has indicated that political activism of the alienated youth is generational and psychological in origin. He attributes student activism to unresolved oedipal conflicts and negative identification with parents. He calls it a "politics of the unconscious."

Emotions issuing from the student's unconscious and deriving from the conflict of generations impose or attach themselves to the underlying irrational directions (p. 8).

For Feuer, psychological alienation as represented by the "hippie sub-culture" and activist political alienation as represented by "student political movements" are inseparable.

Richard Flacks (1967), on the other hand, asserts that student political alienation is not derived from oedipal conflicts with authoritarian parents but rather is a direct expression of a perceived discrepancy between the values imposed by parents and the prevailing practices of the society. Some of these activists are the children of liberal radical parents who emphasize and value humanitarianism, intellectualism and romanticism in their personal lives. Thus, the activists are, in fact, living out the values of the parents and in so doing are forced into conflict with society.

According to Flacks, activist political alienation is not born out of rejection of parental values, but rather out of successful socialization.

In this way, the values that an earlier generation espoused in an abstract way have become embodied as personality *traits* in the new generation . . . In this

sense, the students who engage in protest or who participate in “alienated” styles of life are not “converts” to a deviant adaptation, but people who have been socialized into a developing cultural tradition (Flacks, 1967, p. 63).

While Flacks focuses on ‘generational continuity,’ Feuer postulates ‘generational conflict’ as the underlying reason for contemporary student political activism. Feuer’s description of the alienated activist is similar to Keniston’s characterization of the ‘uncommitted’ except that Keniston’s uncommitted were apolitical nihilists whereas Feuer’s radicals are political activists. Flacks’ description of activists is reminiscent of Keniston’s ‘young radicals,’ though one notices distinct differences in the family backgrounds and political orientations of the two. A brief description of Keniston’s “uncommitted” and the “young radicals” would help to bring out the distinguishing features of the two forms that student dissent has taken in recent years.

Distinguishing Features

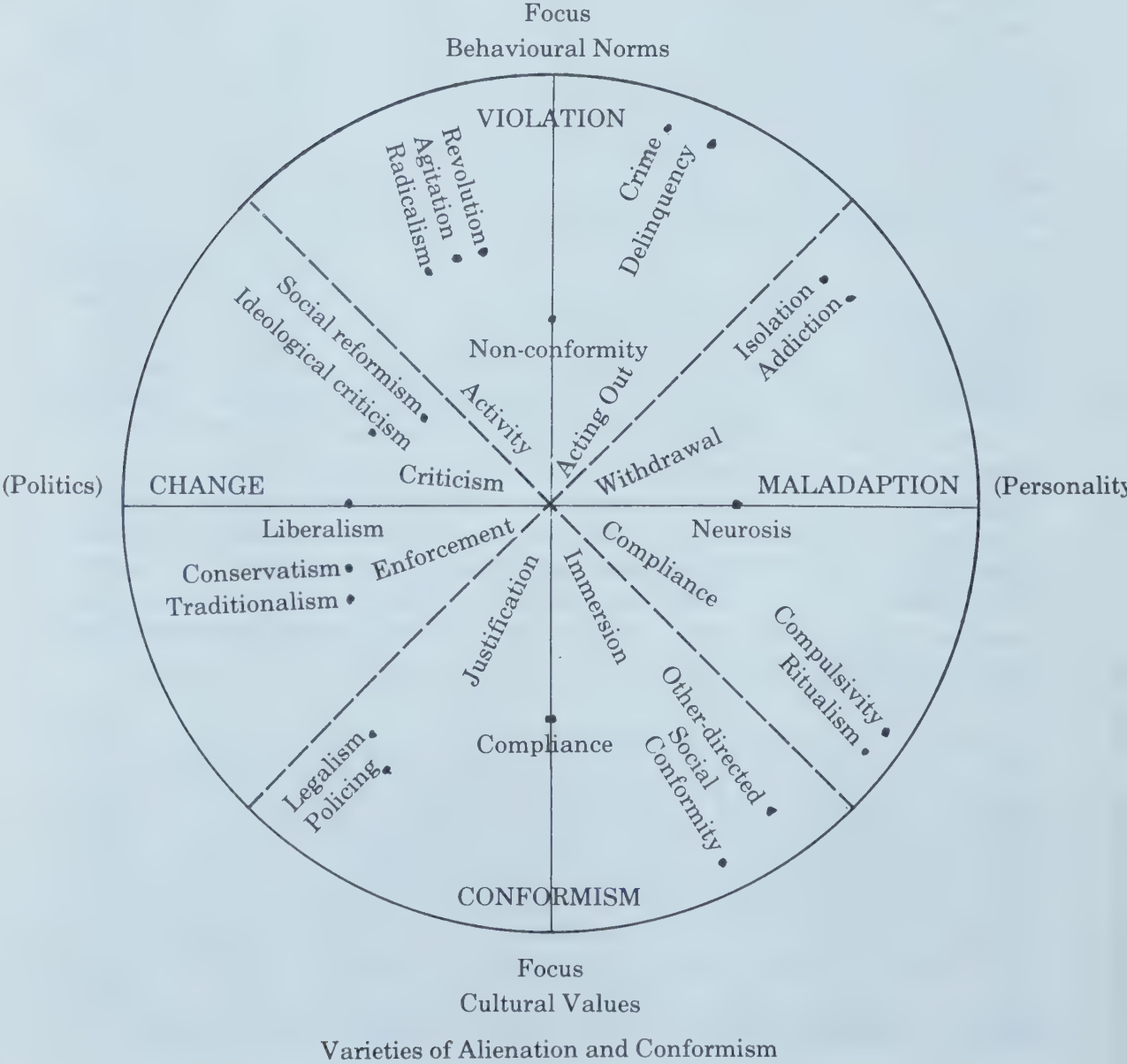
Keniston characterizes his activists as highly committed to some social or political cause. Philosophically, the activist believes that the traditional social and political institutions in his society have failed and must be replaced by new participatory and decentralized institutions. The psychologically alienated student, in contrast to the politically optimistic protestor, is too pessimistic and unconcerned to engage in any kind of organized protests. His demonstrations of dissent are private: through nonconformity of life-style, behaviour and ideology, through personal experimentation in hallucinogenic drugs and through efforts to enhance his own subjective experience, he shows his disapproval of and disinterest in politics. Whereas the activist is interested in social reform and reconstruction, the alienated is convinced that society is beyond restoration and considers “dropping out” the only alternative solution. Thus, despite occasional agreement in principle between the alienated and the activist, cooperation in practice between the two has been rare. Activist accuses the alienated of “irresponsibility”, while the alienated is convinced that the activist is “moralistic,” “uptight” and “uncool” (Keniston, 1968, pp. 302-304).

Keniston’s studies of the uncommitted and the young radicals led him to suggest that political alienation is the diametric opposite of psychological alienation. Whereas activism denotes commitment, alienation denotes lack of concern; whereas activism indicates an optimistic confrontation with social injustice, alienation indicates a pessimistic negativism and nihilistic political apathy.

Hypotheses on the Measurement of Alienation

It is quite conceivable from the above discussion that alienation runs along a continuum, one end of which may be characterized as violation or repudiation of social and cultural norms and the other end over-adaptation to these norms. It is also plausible that alienation generates active as well as passive response. Extreme radical activities (Marx’s rebellion) would be the active response, and extreme psychological withdrawal (Merton’s retreatism) the passive response, respectively, generated by the end denoted by rejection. On the other hand, repressive policing activities (Durkheim’s fatalism) may be conceived as the active

response and compulsive psychological conformity (Fromm's conformism and Merton's ritualism) as the passive response, respectively, generated by the end we have called over-adaptation. In between these two extremes would lie a state of moderate alienation in which an individual accepts some of the social and cultural values while rejecting others (Durkheim's state of moderate integration as well as regulation, see column 5, Table 1). Since alienation runs along a continuum, it is possible to measure a person's degree or extent of alienation on the basis of his response scores to a set of variables measuring dissent vs. conformity to social and cultural norms. We also feel that it is possible to determine the nature of a person's alienation, that is, whether his alienation is sociogenic or psychogenic in nature by including in the measures indices for several types of alienation. The above formulations can be represented as shown in the diagram below. This is, in fact, a simplified—and modified to some extent—version of Keniston's varieties of alienation and conformism (1965, pp. 470-471).



Research results of an empirical study (Dienst, 1971) completed recently at the Centre for Research and Development in Higher Education, University of California, Berkeley, lend partial support to some of our hypotheses. Evelyn Dienst, in her research on a sample of college students, delineated (using the factor analytic techniques) two distinct and independent dimensions of student alienation: psychological alienation, and activist political alienation. Psychological alienation was found to be associated with variables represented on the subdimensions powerlessness, isolation, meaninglessness and normlessness, and activist political alienation was related to activities associated with left-wing radical activism in the United States. While the items used in the measurement of psychological alienation referred to the individual's feelings about himself and his relationships with others, the items selected to measure activist political alienation were phrased to describe the individual's feelings about the social system and its policies.

Dienst found a positive relationship between the activist political dimension of alienation and various measures of intellectuality, liberalism, interaction with others, and positive self-image, and a negative relationship between the psychological dimension of alienation and measures of psychological stability, self-esteem, and ability to interact with others. She also discovered the psychological dimension to be consistent with passive retreatist and the active political dimension compatible with active radical interpretations of alienation.

Dienst's description of the personal characteristics of the young activists suggest that they are unusually psychologically healthy and personally integrated people (see also Heist, 1966, and Trent and Craise, 1967). As Bay (1967) has argued, some degree of political and social activism is, perhaps, symptomatic of psychological health and a necessary condition for a dynamic and viable society.

The work of McLeish (1968) on College of Education and University students in Britain and on non-University post-secondary students in the Province of Alberta lends strong support to these findings. For example, university students are classified into one central and eight bipolar types (McLeish, 1968)—quietists; enthusiasts-rebels; oracular-participatory; tutor centred-student centred; group oriented-individually oriented—on the basis of their expressed attitudes to the teaching methods lecture, tutorial and seminar. This attitudinal typology is found to be congruent with various personality structures and social-political attitudes. In particular, "enthusiasts", who express a high regard for all three teaching procedures, are found to score high on measures of neuroticism and extraversion whereas "rebels", who rate all three teaching methods at the low extreme are, relatively speaking, tender-minded radical introverts *with high scholastic standards*. In other words, the latter group, the (so-called) "rebels" or "alienated" students, are relatively stable and oriented towards relevant understanding whereas it is the "enthusiasts" or "conformists" who must be classified as insecure and maladjusted. The intermediate group, or "quietists", are extremely stable, tough-minded conservatives with low commitment to ideas and with a high power need.

Keniston (1968) observes that any attempt to repress constructive polit-

ical activism among young activists would mean losing a considerable reservoir of talent which could otherwise be used to bring about much desired social change. Political activism may even encourage and draw into its circle some of the romantic alienated students by offering them some positive and meaningful directions in life and thereby lessening their personal feelings of isolation, ineffectuality and meaninglessness.

The psychologically estranged youth who manifests his alienation either by over-conforming to the social and institutional norms or simply dropping out of the mainstream of social life deserves public concern and attention.

Implications

Few campus issues today concern the public or the intellectual community as much as the recent student political activism and the new and deviant lifestyles on many university campuses. Only a decade back, social scientists were decrying the silence and apathy of college students towards national and international issues. Today, they are perplexed over the much publicized upsurge in student dissent. University administrators are under increasing political pressure to deal with the problems emanating from the so-called radical fringe. Little concern—public or political—has been expressed with regard to alienation among the “silent majority” which involves what Fromm has described as passive and ritualistic social conformity.

It is important to note at this point that political dissent is by no means widespread among college students. Every objective study or survey shows, on the contrary, apathy and despair far more dominant than political dissent (Katz, 1967; Peterson, 1966). Even at those colleges where political activism is visible, the vast majority of students—probably over ninety-five percent—remain interested onlookers or opponents of conflict rather than active participants. At most college campuses, student activism is not visible at all. Student political dissent, though limited to a small minority, becomes highly visible because these students use the mass media in a very effective way and consequently succeed in their attempts to make themselves and their causes noteworthy.

In view of the increasing enrolment in colleges and universities of students coming from the lower half of the socio-economic strata, one might anticipate an increase in passive and conformist forms of alienation on college campuses in the coming years. It becomes incumbent upon university administrators to deal with such nondisruptive but substantive forms of alienation as assiduously as they have assumed the responsibility to deal with the manifest political forms of alienation. As Dienst has observed it is usually the activist political alienation which excites attention among the college administrators, whereas among the psychologically alienated, the quiet conformists or those who drop out, go unnoticed.

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Auditory Segmentation and Auditory Blending in Relation to Beginning Reading

Tests in auditory segmentation and auditory blending were administered to 126 grade 1 and 2 subjects. Assessment was made of the development of skills in both areas. Relationships between the tasks were examined as a function of grade, type of unit, and length of sequence, and success in auditory segmentation and auditory blending were compared to reading achievement and mastery of other reading subskills. Results indicated that auditory blending, a higher-order, more complex skill than auditory segmentation, is also more closely related to reading success than is auditory segmentation. Success in auditory segmentation is heavily dependent upon knowledge of word meanings and awareness of the stress and intonation patterns inherent in the spoken language, while immediate memory is a crucial factor in auditory blending. For primary age children, the natural perceptual unit of spoken language is more likely the syllable than the phoneme. Phonemes must be learned as abstract concepts, and acquisition of these concepts is a critical factor in success in beginning reading.

The importance of auditory perception in beginning reading has been well established at a general level. A recent study of phoneme discrimination revealed that, by the year end of grade 1, few children experienced difficulty in discrimination of single phonemes and suggested that examination should be made of the subskills of auditory perception which had received insufficient analysis and study (Smythe, Hardy, Stennett, & Wilson, 1971). Two of these subskills, auditory segmentation and auditory blending, were the subject of this study.

Auditory Segmentation

Auditory segmentation involves the ability to segment utterances of various types and lengths into subunits of various types and sizes, e.g.,

sentences into words, words into syllables, and words into phonemes. Some disagreement currently exists regarding the natural perceptual units of spoken language. Piaget's early work revealed that sentence awareness precedes awareness of individual words (Piaget, 1955). Savin and Bever (1970) determined that adults could segment speech utterances into phrases, words, syllables, and phonemic and phonetic units, but questioned the order in which these units are normally recognized. Whereas linguists have traditionally studied the recognition of word boundaries (Fries *et al.*, 1966), recent studies examining the development of natural perceptual units of spoken language have suggested that these units may be different at various stages of language development.

Several investigators have attempted to assess young children's ability in auditory segmentation. Marsh (1969) estimated that children segment speech into 2- or 3-word units, probably at the level of phrase boundaries. Huttenlocker (1964) and Karpova (1966) found children from 3½ to 7 years of age unable to segment sentences into words but Karpova's Ss were able to make simpler divisions into subject and predicate. Elkonin (1963) found that 5- and 6-year olds were unable to segment words into phonemes. Dolch and Bloomster (1937) and Bruce (1964) claimed that children under 7 years are unable to master the task of phonemic segmentation. Holden and MacGinitie (1969), attempting to evaluate kindergarten children's ability to segment sentences and groups of words to individual words, discovered that function words were more difficult to segment than content words, and that a child's sensitivity to the rhythmic aspects of an utterance influenced the way in which he segmented it. Rosner (1971), who gave a group of non-reading grade 1 children daily auditory training designed to teach them to add, omit, substitute, or rearrange the phonemic elements of spoken words, comparing them to a control group given no similar training, found the training group superior in both auditory analysis and word recognition ability.

It is unclear, therefore, what the nature of the perceptual units of spoken language is, and in what sequence children acquire the ability to identify and segment these units in speech utterances. The discrepancies in the above findings with children may be a function of the various ages of Ss, methods of assessing segmentation skills, and type of unit of segmentation (words or phonemes). Very little investigation has been made of the relationship between skill in segmentation and success in beginning reading.

Auditory Blending

Auditory blending is the ability to produce a word by synthesizing its component sound elements (syllables or phonemes), when they are presented orally at ¼ sec. intervals (Chall, Roswell, & Blumenthal, 1963). Although auditory blending has not been included as a basic instructional skill in beginning reading programs, specialists in the field of reading disability have recognized the importance of this skill in remedial reading instruction. Reynolds (1963) found a positive relationship between auditory blending skill and word recognition ability in grade 4 children. Chall *et al.* (1963) found that auditory blending ability and oral and silent

reading ability were positively related at all grade levels from 1 to 4. The strongest relationships were between auditory blending and oral reading ability, specifically word analysis skills. In a study involving grade 4 children with reading difficulties, Hardy (1965) demonstrated both that skill in auditory blending could be improved through appropriate instruction and that oral reading ability (word recognition) was enhanced as a result. Flynn and Byrne (1970) found educationally advanced grade 3 children superior to educationally retarded Ss in auditory blending.

Brown (1970), in a study of the effects of certain linguistic dimensions on auditory blending performance in pre-schoolers found that syllables were easier to blend than phonemes, consonant-vowel breaks (e.g., n-o) were more difficult than vowel-consonant breaks (e.g., u-p), and that training in syllable blending did not transfer to phoneme blending performance.

Thus, while the relationship between auditory blending and success in reading ability (and in particular word recognition skill) is well documented, the early development of auditory blending ability has not been extensively investigated.

The present study was designed to: (1) assess the development of skills in auditory segmentation and auditory blending in primary school children; (2) study the relationships between these skills as a function of grade level, type of unit and length of sequence being segmented or blended, and (3) relate the abilities in auditory segmentation and blending to measures of other subskills involved in beginning reading.

Method

Subjects

Ss of the study were 126 grade 1 and 2 children enrolled in Lorne Avenue Public School, in London, Ontario. This school is located in the inner city and contains a high proportion of children from lower socioeconomic backgrounds. The 81 grade 1 Ss, 43 boys and 38 girls, had a mean age of 6.4 years. The 45 grade 2 children, 26 boys and 19 girls, had a mean age of 7.6 years.

Test Development

Auditory segmentation. The auditory segmentation test (AST) consisted of 3 subtests, i.e., sentences into words (SW), words into syllables (WSi), and words into phonemes (WP). SW was made up of 15 sentences varying in length from 3 to 7 words, with 3 sentences of each length. The sentences were constructed of familiar, frequently occurring words in order to reduce the memory demands of the task. WSi contained 15 words of 2, 3, and 4 syllables, with 5 of each length. The 15 words in WP were of 2, 3, and 4 phoneme lengths, again with 5 of each length. The words in both tests were chosen on the basis of familiarity and ease of articulation. The items used in AST are included in Table 1 in order of length of utterance for each subtest. However, in testing, the order was randomized by length within each subtest.

Auditory blending. The auditory blending test (ABT) consisted of 2 subtests, i.e., syllables to words (SiW), and phonemes to words (PW). The

15 items of SiW were of 2, 3, and 4 syllable lengths, with 5 at each level, chosen on the basis of familiarity and ease of articulation. PW contained 13 2-phoneme, 12 3-phoneme, and 6 4-phoneme words. These items were composed of representative phonemic components and included all possible combinations of single consonants, consonant blends, consonant digraphs, single vowels, controlled vowels, vowel blends, and vowel digraphs. Table 2 contains the items used in ABT in the order in which they were presented.

The larger study of which AST and ABT were a part (Stennett, Smythe, Hardy, Wilson, & Thurlow, 1971), involved 16 tests. Brief descriptions of 5 of these tests which are pertinent to this study, follow.

Reading achievement. At a point near the end of the school year the teachers of the children involved in the study supplied a grade equivalent, oral reading score for each S. If a grade 2 child, for example, were rated by his teacher in June as having reading skill typical of that usually developed by most grade 2 students in January, that child would be assigned a grade equivalent score of 2-5, i.e., grade 2, fifth month. Such ratings, therefore, represent the teacher's assessment of achievement levels in 'absolute' terms.

Phoneme span. Ss were presented with sets of phoneme strings which varied in length from 2 to 5 phonemes, and were required to reproduce each sound string in the order in which it was given. The strings were composed of heterogeneous sets of long vowels, short vowels, and consonants given at 1 sec. intervals. The particular index of memory for speech sounds reported here was the total number of speech sounds each child was able to recall, regardless of order.

Word recognition and decoding. A series of 225 letter combinations, 75 each of lengths 2, 3, and 4 letters were presented visually to each child. One-fifth of all the items were real words which occur with high frequency in children's readers (Stennett, Smythe, Hardy, & Wilson, 1971) while the other 180 items were nonsense syllables. Upon presentation of each item S was required to judge whether it was a real word. Items were presented at the rate of 1 every 3 sec. A S's recognition score was the number of real words he identified correctly. After completion of the word recognition phase, S was shown the items he had indicated were real words and was asked to decode them. His decoding score was the number of real words he decoded.

Visual segmentation. This 60-item test was composed of 30 5-letter, and 30 7-letter combinations. Each 5-letter combination contained a digraph (i.e., 2 adjacent letters) which appears with high frequency in the English language, while the 7-letter items each contained 1 high-frequency trigraph. The remaining letters in each item were selected so that all other combinations, save for the target digraph or trigraph, were of very low frequency of occurrence (Underwood and Schulz, 1960).

Each item was presented by means of a carousel projector and children were asked to identify the two (or three) letters 'that are sometimes part of real words'. Separate recognition scores were recorded for both digraphs and trigraphs appearing in the initial, medial, and final positions.

TABLE 1
MEAN PERCENT CORRECT SCORES FOR AUDITORY SEGMENTATION AS A FUNCTION OF TYPE OF UNIT
AND GRADE

Sentences to Words			*** ds to Syllables			Words to Phonemes		
% Correct			% Correct			% Correct		
Grade			Grade			Grade		
Item	1	2	Item	1	2	Item	1	2
Come and help.	100	100	going	98	96	each	74	84
See the house.	98	93	before	96	98	oak	63	67
It is morning.	98	96	able	96	98	ice	53	69
			over	88	87	bow	52	69
			never	25	24	if	40	64
We can play school.	98	98						
I saw a goat.	96	91	potato	64	75	meet	19	16
See the boat go.	95	91	beautiful	58	80	hit	14	18
			afternoon	58	67	deep	11	18
Look at the big fish.	93	82	beginning	10	29	heel	7	10
They went to the house.	93	89	another	4	4	used	6	11
I am going to run.	90	93						
I can play in the snow.	94	96	Elizabeth	43	38	yells	6	4
We have to go to school.	90	89	helicopter	32	49	rocks	3	4
The red ball is the biggest.	95	89	supermarket	22	31	bombs	2	7
			alligator	4	20	steps	1	4
			television	3	18	likes	1	4
How far is it to the lake?	86	82						

TABLE 1 (contd.)

Phonemes to Words									
2-Phoneme			3-Phoneme			4-Phoneme			
% Correct			% Correct			% Correct			% Correct
Grade			Grade			Grade			Grade
Item	1	2	Item	1	2	Item	1	2	1 2
s-ee	64.2	84.4	b-ur-n	38.3	64.4	r-ou-n-d	22.2	48.9	
b-oy	64.2	88.9	thr-oa-t	35.8	64.4	pl-a-n-t	19.8	42.2	
sh-e	60.5	91.1	tw-i-n	34.6	53.3	h-o-l-d	14.8	51.1	
tr-y	59.3	86.7	r-u-n	30.9	26.7	m-o-n-ey	13.6	35.6	
sn-ow	58.0	82.2	fl-ow-er	29.6	51.1	ch-a-n-ge	12.3	42.2	
n-o	48.1	64.4	ch-ee-se	27.2	55.6	s-u-mm-er	12.3	31.1	
sm-all	48.1	77.8	sh-i-p	25.9	44.4				
ch-ew	46.9	77.8	cr-aw-l	22.2	37.8				
u-p	42.0	62.2	b-oi-l	21.0	55.6				
th-ey	38.3	60.0	t-ai-l	17.3	35.6				
f-or	28.4	51.1	ch-oi-ce	17.3	40.0				
spr-ay	18.5	24.4	wh-ir-l	13.6	33.3				
th-aw	14.8	35.6							

Phoneme-grapheme recognition. Thirty-three sets of 5 graphemes were shown separately to *S* by means of carousel projector. After each set was presented *S* heard a tape-recorded phoneme and pointed to the grapheme associated with that phoneme. The position of the correct response was randomly assigned among the 5 available positions. In order to minimize the visual discrimination requirements of the test, graphemes representing incorrect responses were selected so that they were as visually dissimilar to the correct grapheme as possible. *S*'s score was the number of correct phoneme-grapheme associations made in 3 trials.

Test Administration

In AST, *S* was first asked to repeat each of the items after the examiner. Then *E* demonstrated and gave *S* practice in segmenting the items or 'saying them in parts', i.e., repeating each unit, leaving a pause between each, e.g., 'John likes candy.'—'John . . . likes . . . candy.' The test items were presented individually by tape recorder and *S* was asked to say them in parts.

ABT required *S* to synthesize into words the word parts which he heard at $\frac{1}{4}$ sec. intervals. *E* demonstrated and gave practice in 'putting the parts together to make a word' and then presented the tape-recorded test items, e.g., 'but . . . ter'.

AST and ABT, parts of a battery of 16 tests, were given in randomized sequence on different days to control for possible transfer effects.

Data Handling and Statistical Analysis

Analysis included a simple tabulation of error patterns and trends and the following statistical computations: (1) calculation of a percentage correct score separately for each grade, level (length of utterance), and type of unit (word, syllable, phoneme), for each task (auditory segmentation and auditory blending), (2) an intercorrelation matrix of auditory segmentation and auditory blending scores and other reading subskill measures available from the larger study, (3) a number of analyses of variance with percentage correct scores as dependent variables. In order to obtain equal numbers of observations in each cell for the analysis of variance, 45 of the 81 grade 1 *Ss* were selected randomly to equal the number in the grade 2 sample.

Results

The percentages of items correct on both AST and ABT for all 126 *Ss*, calculated by grade, may be found in Tables 1 and 2.

An analysis of errors for a random sample of twenty *Ss* in AST revealed a number of trends in error types in WS1 and WP subtests. So few errors occurred in SW that no analysis was attempted. Although more detailed analysis is necessary, the following trends were noted: in WSi, *Ss* showed a tendency, with words of more than two syllables, to segment the first syllable only, e.g., a-nother; syllables made up of single vowel sounds, occurring in the medial position in words, appeared difficult to segment, e.g., E-liza-beth. Four-syllable, compound words were segmented as compound words, e.g., super-market. In WP, a definite trend toward seg-

TABLE 2

MEAN PERCENT CORRECT SCORES FOR AUDITORY BLENDING AS A FUNCTION OF TYPE OF UNIT AND GRADE

Syllables to Words										
2-Syllable			3-Syllable			4-Syllable				
Item	% Correct		% Correct		% Correct		% Correct			
	Grade		Grade		Grade		Grade			
	1	2	1	2	1	2	1	2	1	2
but-ter	98.8	95.6	tel-e-phone		85.2	95.6	man-u-fac-ture		54.3	73.3
doc-tor	93.8	97.8	pas-sen-ger		75.3	93.3	e-mer-gen-cy		28.4	64.4
num-ber	92.6	97.8	cal-en-dar		71.6	86.7	ter-ri-tor-y		28.4	48.9
sav-ing	92.6	95.6	hos-pi-tal		71.6	93.3	ed-u-ca-tion		25.9	55.6
for-est	65.4	80.0	lo-ca-tion		45.7	77.8	dif-fi-cul-ty		25.9	46.7

menting the first phoneme and than repeating the whole word was noted, e.g., o-oak. Other common errors were: including the medial vowel with the initial consonant in 3-phoneme words, e.g., mee-t; segmenting only the first phoneme, e.g., b-ombs; dividing 4-phoneme words into 2 parts, e.g., ste-ps; segmenting whole words and word endings in 4-phoneme words, e.g., rock-s.

In ABT an analysis was made of item difficulty in relation to the phonemic composition of the items. Errors were tallied by type and comparisons made between easier and harder halves of each subtest. Although it is difficult to draw conclusions because of the small number of items of each of the various phonemic structures, some trends were noted. In SiW, consonant-consonant blends appeared to be easiest, followed by consonant-vowel combinations, with vowel-consonant breaks presenting most blending difficulty. An error-tally for PW suggested that of the seven elements included (single consonants, consonant blends, consonant digraphs, single vowels, controlled vowel, vowel blends, vowel digraphs), vowel digraphs and controlled vowels may be somewhat more difficult to blend than the other types of components. Verification of this finding, with a larger number of items, is needed.

Correlational Analysis

Table 3 presents the intercorrelations among auditory segmentation, auditory blending, and 7 other variables included in the larger study.

Though not included in Table 3, sex and chronological age yielded non-significant *rs* with all other variables. An examination of the relationships between the 2 AB subtests and among the 3 AS subtests suggests that success in blending and segmentation varies somewhat according to the type of unit involved, with blending success less dependent upon type of unit than segmentation success.

TABLE 3
INTERCORRELATION MATRIX FOR AUDITORY SEGMENTATION,
AUDITORY BLENDING AND 7 OTHER VARIABLES

Variables*	2	3	4	5	6	7	8	9	10	11	12
1. Reading Achievement	46	61	62	15	36	26	63	78	60	58	65
2. Phoneme Span		53	44	12	20	17	41	47	36	42	43
3. Auditory Blending: SiW			67	17	32	38	52	65	42	40	64
4. Auditory Blending: PW				19	34	50	40	60	42	41	62
5. Auditory Segmentation: SW					24	22	09	14	01	02	07
6. Auditory Segmentation: WSi						35	24	35	25	29	33
7. Auditory Segmentation: WP							15	33	16	16	43
8. Recognition								78	52	42	54
9. Decoding									58	47	75
10. Visual Segmentation: Digraphs										66	40
11. Visual Segmentation: Trigraphs											31
12. Phoneme-Grapheme Recognition											

* With N = 126 a correlation of .175 is required for significance at $p < .05$; .229 for $p < .01$.

The size of the correlations between blending SiW and segmenting WSi, and between blending PW and segmenting WP indicates that skills in auditory blending and auditory segmentation are not highly related, i.e., success in either blending or segmentation does not necessarily imply success in the other skill. Examination of segmentation skill across sensory modalities (auditory segmentation and visual segmentation) revealed that ability to segment visual and auditory material into units is modality specific.

The higher *rs* between phoneme span and auditory blending than between phoneme span and auditory segmentation suggest that memory is a more critical factor in blending than in segmentation. Auditory segmentation and auditory blending were correlated with several reading-like tasks (Recognition, Decoding, and Phoneme-Grapheme Recognition) as well as with teacher estimate of Reading Achievement (oral reading skill). Each of the reading-like tasks was significantly related to every other one and to Reading Achievement. In each case blending was more highly related to the reading-like tasks and to Reading Achievement than was segmentation.

The size of *rs* for segmenting SW probably reflects the reduced variability in this subtest because of high scores.

Analyses of Variance

Three-way analyses of variance, using percent correct scores, were performed separately for AS and AB. The following factors and levels were employed: *Grade* (2), *Length* of Sequence (3), and *Type* of Unit (3 levels

TABLE 4

MEAN PERCENT CORRECT RESPONSES FOR AUDITORY SEGMENTATION AS A FUNCTION OF GRADE, LENGTH OF SEQUENCE, AND TYPE OF UNIT (N = 45 PER CELL)

Type	Grade One		Grade Two	
	M	SD	M	SD
Sentence to Words				
3 and 4 words	98.00	11.79	98.20	6.92
5 words	94.91	16.70	96.58	9.73
6 and 7 words	95.20	16.21	96.18	8.44
Words to Syllables				
3 syllables	80.11	11.18	82.11	10.49
4 syllables	54.69	19.16	63.07	16.07
5 syllables	46.44	22.90	54.33	23.23
Words to Phonemes				
3 phonemes	57.44	34.14	71.67	33.44
4 phonemes	29.42	21.79	30.36	25.75
5 phonemes	19.67	17.66	22.11	20.99

TABLE 5

SUMMARY OF ANALYSIS OF VARIANCE OF AUDITORY SEGMENTATION
PERCENT CORRECT SCORES AS A FUNCTION OF GRADE, LENGTH OF
SEQUENCE, AND TYPE OF UNIT

Source	df	MS	F
Between S's	89		
A (Grade)	1	3,746.38	2.99
S's W	88	1,253.42	
W S's	720		
B (Length of Sequence)	2	48,586.34	267.43***
A x B	2	69.85	0.38
B x S's	176	181.68	
C (Type of Unit)	2	229,045.66	393.10***
A x C	2	570.02	0.98
C x S's	176	582.67	
B x C	4	11,040.51	61.92***
A x B x C	4	708.36	3.97**
B x C x S's	352	178.29	
Total	809		

** $p < .01$

*** $p < .001$

for segmentation and 2 levels for blending). The latter two factors involved repeated measures. In order to maintain three levels of the length factor for each task (segmentation and blending), the data for segmentation: SW were combined to create 3 lengths, i.e., 3- and 4-word sentences, 5-word sentences, and 6- and 7-word sentences.

Table 4 presents the means of percent correct responses and Table 5 the summary of analysis of variance of auditory segmentation percent correct scores as a function of *Grade*, *Length* of Sequence, and *Type* of Unit. Examination of Table 5 reveals no simple main effect of *Grade* but significant effects of *Length* of Sequence and *Type* of Unit, indicating that performance in segmentation drops as a function of increasing length of item and that SW is the easiest task for both grades, followed by WSi and WP. Two of the higher-level interactions were significant. The *Length* x *Type* interaction indicates that decrement in performance as a function of length is less pronounced in SW than in WSi or WP for both grades. However, inspection of the 3-way interaction of *Grade* x *Length* x *Type* reveals that the decrement for grade 2 in segmentation of WP is more pronounced than for grade 1.

Table 6 presents the means of percent correct responses and Table 7 the summary of analysis of variance of auditory blending percent correct scores as a function of *Grade*, *Length* of Sequence, and *Type* of Unit. The analysis of variance disclosed 3 simple main effects (*Grade*, *Length* and *Type*). Performance of the grade 2 sample was better than that of grade 1; longer items were more difficult than shorter ones; and it was

TABLE 6

MEAN PERCENT CORRECT RESPONSES FOR AUDITORY BLENDING AS A
FUNCTION OF GRADE, LENGTH OF SEQUENCE, AND TYPE OF UNIT
(N = 45 PER CELL)

Task	Grade One		Grade Two	
	M	SD	M	SD
Syllables to Words				
2 syllables	88.11	21.36	94.33	17.55
3 syllables	69.44	29.44	90.33	17.51
4 syllables	35.67	32.57	58.78	33.31
Phonemes to Words				
2 phonemes	43.98	29.23	69.29	21.90
3 phonemes	23.78	21.79	48.47	23.95
4 phonemes	16.56	23.12	42.49	31.73

TABLE 7

SUMMARY OF ANALYSIS OF VARIANCE OF AUDITORY BLENDING
PERCENT CORRECT SCORES AS A FUNCTION OF GRADE, LENGH OF
SEQUENCE, AND TYPE OF UNIT

Source	df	MS	F
Between S's	89		
A (Grade)	1	59,682.09	27.20***
S's W	88	2,193.85	
W S's	450		
B (Length of Sequence)	2	57,095.47	155.63***
A x B	2	967.32	2.64
B x S's	176	366.87	
C (Type of Unit)	1	138,400.04	258.05***
A x C	1	2,478.98	4.62*
C x S's	88	536.34	
B x C	2	7,867.03	28.88***
A x B x C	2	936.21	3.44*
B x C x S's	176	272.39	
Total	539		

* p < .05
** p < .01
*** p < .001

easier to blend SiW than PW. Three of the 4 higher-level interactions were significant; *Grade x Type*, *Length x Type*, and *Grade x Length x*

Type. These findings can be interpreted as follows: the difference in performance between grade 1 and grade 2 is more pronounced in the case of PW (25.31%) than in SiW (16.71%); the decrement in performance as a function of length in the case of blending SiW is more pronounced. Between 3- and 4-unit items; the effect of increasing the number of units to be blended was more severe in grade 1 than grade 2 in SiW.

Discussion

Error analyses, for both AST and ABT, while indicating definite trends, do not allow extensive interpretation due to limitations in the data. In AST a more rigorous error analysis of a larger sample is required, while in ABT an analysis of errors reflecting phonemic components and item structure should be carried out, using a larger number of items of each type.

Although the findings of the study suggest that the skills of auditory segmentation and auditory blending are not highly related, the fact that the items of AST and ABT were not identical requires that this inference be regarded as tentative.

It is possible to rationalize the major findings of this study in terms of three factors, i.e., memory, familiarity with spoken language, and learning or instruction. The order of difficulty of the items varied as a function of the type of unit involved in both segmentation and blending, i.e., performance in both tasks decreased as the type of unit decreased in size and hence in inherent meaning (from words to syllables to phonemes in AST, and from syllables to phonemes in ABT). However, length of sequence had a more pronounced effect than type of unit and this effect was more apparent in ABT than in AST. In ABT : SiW length of sequence became important for success with items of more than three parts, but no similar effect was found in AST. The effect of increasing the length of sequence to be blended was more dramatic in grade 1 than grade 2. These findings implicate memory as a more important factor in blending than in segmentation. In AST Ss are required to hold in memory and to segment familiar, meaningful units (sentences or words), while in ABT relatively meaningless units (syllables or phonemes) must be held in memory and then synthesized to produce meaningful wholes. The memory requirements of segmentation and blending have differential effects upon success in the two tasks. In segmentation, Ss are able to segment as much of the utterance as they can remember, but in blending it is impossible to produce a meaningful response (word) unless the entire segmented utterance can be held in memory and then synthesized. The difference in skill in blending between grades 1 and 2 reflects, in part, the effects of instruction and experience with words and word parts to which grade 2 Ss are exposed. In blending SiW it appears that memory becomes an important factor in success after the sequences exceed three in number, i.e., even though Ss might be able to blend sequences of more than three syllables, memory limitations prevent this. Memory played a more important part with phonemes than with syllables, i.e., increasing the length of phoneme sequences was more critical than increasing the length of syllable sequences.

The greater familiarity of the syllable, as a unit, as compared to the phoneme, as a unit, probably accounts for this finding.

Examination of segmentation and blending in relation to oral reading achievement and success in other reading skills, as well as to instructional practices in beginning reading, reveals that blending is more strongly related to these factors than segmentation. The nature of the tasks involved in blending are probably more closely related to the reading task than are those in segmentation. Instructional practices in beginning reading tend to emphasize auditory synthesis into wholes rather than segmentation into parts. It may be that segmentation is more related to the task of spelling than to reading. In ABT grade 2 Ss showed significantly superior performance over grade 1 Ss in blending PW, which reflects the effect of instruction, i.e., in grade 2 students are not only taught a larger number of phonemes than grade 1 students, but these phonemes are given more emphasis and are applied in the task of word analysis.

Ability in auditory segmentation varied more with the type of unit involved than did auditory blending, i.e., in segmentation it seemed to make more difference whether the unit to be segmented was a sentence, syllable or word, than it did in blending whether the unit to be blended was a syllable or phoneme. This finding reflects the relative importance of familiarity with the spoken language in segmentation, as compared to blending. In segmentation (with SW and WS1 in particular), the natural intonation and rhythm of the language assist in the task, while in blending (in which relatively unfamiliar word parts have to be synthesized), natural, learned language patterns cannot be called upon as an aid.

The results of this study suggest that, for primary level children, the "natural" perceptual unit of spoken language is the syllable, not the phoneme. Because of the natural intonation and rhythm of the language, awareness of the syllable is readily established, but phonemes, as language units, must be learned. Since word analysis requires manipulation of phonemes, success in beginning reading depends upon the extent to which the child is able to develop a distinct auditory image or concept of each of the speech sounds. Blending, which appears to be a higher-level, more complex skill than segmentation, is also more highly related to reading achievement than segmentation. More information is needed to document the developmental patterns of both segmentation and blending.

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Some Correlates of Political and Religious Beliefs in Student-Teachers

The scores of almost one thousand student-teachers and post-graduate students in the Faculty of Education at Edmonton on thirty key variables of personality, values, educational and social attitudes are analyzed. Significant associations are found between these variables and religious and political affiliations, sex and type of course (undergraduate, after-degree or post-graduate). Factor analysis of the thirty variables reveals a student typology consisting of eleven bipolar categories.

Before beginning their courses in the Faculty of Education, it was planned that all entrants at The University of Alberta should be administered the *Survey of Educational Opinions*. Arrangements were made for these students to be tested in groups over a period of two days. On completion, it was discovered that only forty percent of the graduate student-teachers (Professional Diploma after Degree) had been captured by the sampling method used, and sixty-seven percent of the Bachelor of Education (freshman) group.

TABLE 1
THE SAMPLE TESTED

Description	B.Ed. (freshmen)	P.D.A.D.	Totals
Enrolment	840	421	1,261
Tested on Intake	562	177	739
Percentage Tested	67.26%	42.04%	58.58%

This result was extremely disappointing, especially as the nature of the biases in the sample must remain unknown. In the circumstances the original intention of relating this pre-test to performance in courses, and to

a post-test which could reveal changes associated with these courses, was abandoned. However, it was decided to salvage the data as certain relationships could still be made out. The fact that we had succeeded in collecting information from more than 700 students, in the form of measurements on 30 variables, using standard instruments, was in itself an achievement justifying the investment of time and money. Although the sample is biased in unknown ways, it is also a fact that certain comparisons are less affected than others. For example, factor analyses should be minimally affected, likewise religious and political comparisons. It is when comparisons are made with non-Canadian groups that the sampling bias is, presumably, operative at a maximal level.

The detailed breakdown of the sample is shown in Table 2. In various comparisons, a third group of Edmonton students, consisting of complete course groups in two graduate programs, will be shown for interest as giving some indications of the possible effects of the initial training on the various kinds of student represented in the sample.

I. General Orientation to Education

There are measures available on six variables which throw light on the general attitude of students to the role, function, activities and profes-

TABLE 2
COMPOSITION OF THE SAMPLE

	B.Ed.	P.D.A.D.	Total
n =	562	177	739
Men	144	59	203
Women	418	118	536
17-25 years	536	147	683
26-35 years	26	30	56
1. Catholics*	139	31	170
2. Orthodox	32	6	38
3. Anglican	34	9	43
4. Protestant	143	42	185
5. Small Sects	117	26	143
6. Far Eastern	6	5	11
7. Atheists	91	58	149
1. Conservatives	89	27	116
2. Liberals	199	62	261
3. Socialists	73	21	94
4. Independent and None	201	67	268

* Includes all those groups which follow the Western (Roman) rite, such as Ukrainian Catholics.

sional satisfactions of the teacher. These are: Formalism, Punitiveness, Emotional Satisfaction derived from Contacts with Children, Attitude to Personal Development, Attitude to Professional Development as a Teacher, Job Satisfaction expected from Teaching as a Career.

Formalism is here defined as the tendency to insist on standards of workmanship and behavior in a teacher-centred classroom with defined formal activities, orderly behavior, homework, and punishment for wrongdoing. This is in contrast to a more permissive, activity-oriented, child-centred and non-punitive attitude. As in other groups tested, the scores on this variable are associated with differences in academic standing, age, religion and political affiliation.

Apart from the course, sex and age differences, the only other differences (shown by an asterisk) which are statistically significant, are as follows: atheists and agnostics are much more permissive than any of the religious groups. Conservatives have a very high score in formalism. There is a difference between B.Ed. freshmen and P.D.A.D. students of all

TABLE 3
FORMALISM

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	11.94	10.93	8.99
Women	12.22	9.14	8.95
17-25 years	12.18	10.10	9.24
26-35 years	11.58	7.97	8.52
1. Catholics	13.26	11.06	10.02
2. Orthodox	12.16	12.33	9.80
3. Anglicans	12.56	9.78	7.77
4. Protestants	12.38	10.83	10.07
5. Small Sects	12.83	9.77	9.34
6. Far Eastern	9.67	9.40	11.00
7. Atheists	9.22*	7.98*	7.10*
1. Conservatives	13.37*	12.00*	11.37*
2. Liberals	12.07	9.53	8.93
3. Socialists	11.33	8.95	8.17
4. Independent and None	11.98	9.27	8.36
Average	12.15*	9.74*	8.97*
Index numbers	100	81	75

* An asterisk here, and in later tables, indicates that the group average differs significantly from that of the other groups. It should be noted that the test of significance takes account not only of differences in two averages but also the numbers of cases in each group.

varieties, the former being more strongly in favor of formal methods. Taking the freshmen as having an index of 100, P.D.A.D. students average 81, graduate students 75.

Punitiveness is defined as an attitude favorable to a retributive theory based on the notion that human nature is corrupt and requires to be chastened by physical punishment which acts to keep a check on evil impulses. This is usually associated with a favorable attitude to formal methods of teaching. It is not surprising that somewhat similar trends are indicated although the differences are not so extreme and often do not approach statistical significance. But women appear to be less punitive and less formalist than men; older students are less punitive and less formalist than younger ones; atheists and agnostics are less punitive and less formalist than any religious group, Far Eastern religions excepted. These differences reach significance only in the B.Ed. group. Conservatives are definitely more punitive and formalist than other political groups. The P.D.A.D. group appears to be slightly less punitive than the freshmen group, but again the difference is not statistically significant.

Emotional satisfaction associated with contacts with children measures

TABLE 4
PUNITIVENESS

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	4.23*	4.02	9.34*
Women	3.94*	3.72	7.75*
17-25 years	4.02*	3.88	7.38*
26-35 years	3.81*	3.50	10.28*
1. Catholics	3.99	3.45	7.43
2. Orthodox	3.78	4.50	7.80
3. Anglicans	4.50	3.33	7.69
4. Protestants	3.92	4.07	7.77
5. Small Sects	4.50	4.46	8.79
6. Far Eastern	2.83	3.40	13.50
7. Atheists	3.53*	3.59	9.86
1. Conservatives	4.57*	4.59*	8.27
2. Liberals	4.01	4.00	9.02
3. Socialists	3.52	3.76	9.05
4. Independent and None	3.94	3.36	7.58
Average	4.01	3.81	8.48
Index numbers	100	95	not comparable

TABLE 5
EMOTIONAL SATISFACTION FROM CHILDREN

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	12.49*	12.81*	9.15*
Women	14.41*	14.36*	10.92*
17-25 years	13.97*	13.68*	11.19*
26-35 years	12.92*	14.63*	8.36*
1. Catholics	13.83	13.42	10.61
2. Orthodox	14.38	13.33	11.00
3. Anglicans	13.91	14.00	10.15
4. Protestants	14.17	13.98	10.72
5. Small Sects	13.74	14.15	10.41
6. Far Eastern	13.33	15.20	6.50
7. Atheists	13.77	13.74	9.05
1. Conservatives	13.70	12.96	10.20
2. Liberals	13.97	13.84	9.52
3. Socialists	14.10	15.05*	9.91
4. Independent and None	13.90	13.82	10.93
Average	13.92	13.84	10.11
Index numbers	100	99	73

rather an immature and non-professional attitude of “mothering” children in a caring, rather than a didactic or pedagogical relationship. It is correlated negatively with punitiveness. The differences here lie between the men and women in the sample, and curiously enough, between P.D.A.D. Socialists (who score highest) and P.D.A.D. Conservatives (who score lowest) on this variable. There is a reversal in the case of age, younger B.Ed. students scoring higher than older B.Ed. students, as expected, but older P.D.A.D. students scoring higher than younger. The greatest difference is between the experienced teachers in the graduate program and the two groups of relatively unsophisticated student-teachers. As found in earlier studies, there is a decline in score, associated with actual teaching experience, in this variable.

Attitude to *Personal Development* is a measure of the degree to which the subject places high regard on activities associated with study, such as reading for general improvement, studying for higher academic qualifications and attending lectures by experts.

The major difference here lies between the graduate students and the two student-teacher groups. The sharp decline in the favorable attitude

TABLE 6
ATTITUDE TO PERSONAL DEVELOPMENT

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	14.83	15.17	11.05*
Women	14.60	15.14	12.47*
17-25 years	14.61*	15.17	12.61*
26-35 years	15.73*	15.07	10.54*
1. Catholics	14.63	15.03	12.65
2. Orthodox	15.34	15.50	12.80
3. Anglicans	14.12	15.44	12.15
4. Protestants	14.63	15.83	12.21
5. Small Sects	14.49	14.65	11.44
6. Far Eastern	14.67	15.00	9.00
7. Atheists	14.95	14.88	10.94
1. Conservatives	14.40	15.52	11.93
2. Liberals	14.80	15.26	11.44
3. Socialists	15.18*	15.24	12.17
4. Independent and None	14.45	14.88	12.07
Average	14.66*	15.15*	11.82*
Index numbers	100	103	78

to personal development is probably associated with the career orientation of this group and their probable surfeit of lectures by experts, reading and other activities which have become relatively disfavored because of the compulsions and constraints associated with course work.

Attitude to *Professional Development* is similar to the previous variable. It measures a favorable attitude to the trying-out by the respondent of new teaching methods, attending courses related to professional development as a teacher, and classroom evaluation of students' work. The differences here are between the men and women in the B.Ed. sample, between the religious groups in the same sample, and between the graduate students and both groups of student-teachers. It appears that women freshmen are more favorably oriented towards their own development as teachers. There are also differences which appear between Orthodox Christians, Atheists, and members of small Protestant Sects; the former are more interested, the latter are least interested in their development as teachers. But the actual differences are very small. The graduate students are relatively unfavorable to teaching as a career—this is probably to be explained in the same way as their expressed relative de-emphasis on their personal

development. Surfeit breeds cynicism! There is also a selective factor operating in that satisfied teachers are to be found in classrooms: relatively dissatisfied ones in graduate school.

TABLE 7
ATTITUDE TO PROFESSIONAL DEVELOPMENT

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	17.76*	17.73	12.19*
Women	18.26*	17.97	13.80*
17-25 years	18.11	17.77	14.39*
26-35 years	18.54	18.50	10.89*
1. Catholics	18.14	18.35	14.00
2. Orthodox	18.88	19.50	13.80
3. Anglicans	17.85	18.67	13.15
4. Protestants	18.18	18.64	13.82
5. Small Sects	18.15	16.73	13.21
6. Far Eastern	17.00	17.60	10.50
7. Atheists	17.93	17.36	11.57
1. Conservatives	18.34	17.48	13.20
2. Liberals	18.08	18.21	12.45
3. Socialists	18.58	18.14	12.60
4. Independent and None	17.94	17.69	14.01
Average	18.13	17.89	13.06*
Index numbers	100	99	72

This is true also of the last variable in this group—*Job Satisfaction*. This is a measure of commitment to the task indicated by the prediction of the degree of satisfaction, or interest, associated with defined activities forming part of the job analysis. Here only the differences between men and women are significant, but the actual difference is of the order of one point in nine.

In summary: it may be concluded that with respect to the career of teaching, the attitudes of the various groups tested show little difference in relation to the work involved; differences appear as between religious and political groups in relation to the nature of the teacher's role and function. These differences centre around the core attitudes, towards formal or permissive procedures and towards deserved punishment for wrongdoing.

TABLE 8
JOB SATISFACTION

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	8.26*	8.66*	8.46*
Women	9.29*	9.74*	9.45*
17-25 years	9.01	9.22	9.21
26-35 years	9.38	10.17	8.65
1. Catholics	9.04	9.19	8.88
2. Orthodox	10.13	9.83	7.20
3. Anglicans	8.50	10.00	10.00
4. Protestants	8.99	10.31	9.40
5. Small Sects	8.80	8.58	9.28
6. Far Eastern	7.67	9.40	10.00
7. Atheists	9.26	9.02	8.49
1. Conservatives	8.88	8.52	9.53
2. Liberals	9.09	9.55	8.95
3. Socialists	9.78	10.19	9.77
4. Independent and None	8.77	9.31	8.40
Average	9.03	9.38	8.99
Index numbers	100	104	99

II. Personality Characteristics

Three variables throw light on personality differences between the various groupings—*anxiety*, *neuroticism* and *extraversion*. On intake, these differences are quite small. It would be of considerable interest to discover whether the various programs taken by students operate to increase differences, or whether the Faculty of Education exercises no specific influence on these variables.

Anxiety is measured by means of a word association test based on the principle of presenting the respondent with a choice of associations, selected as discriminating between normal and neurotic (anxious) populations. The only significant differences which appear are between men and women in the B.Ed. program, between Atheists, Protestants and members of small Protestant Sects in the B.Ed. program and between the P.D.A.D. group, the B.Ed. freshmen and the graduate students in the education program.

TABLE 9
ANXIETY LEVEL

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	9.76*	7.32	8.91*
Women	8.83*	6.81	7.47*
17-25 years	9.15	6.94	8.62
26-35 years	7.50	7.17	7.35
1. Catholics	9.74	7.52	7.76
2. Orthodox	10.28	7.67	10.60
3. Anglicans	8.00	6.56	9.00
4. Protestants	8.25*	6.02	7.30
5. Small Sects	8.08*	6.65	8.10
6. Far Eastern	10.17	5.60	14.50
7. Atheists	10.51*	7.64	8.62
1. Conservatives	9.73	7.07	6.87*
2. Liberals	8.77	6.69	7.97
3. Socialists	8.93	7.67	9.17*
4. Independent and None	9.12	6.99	7.83
Average	9.07*	6.98*	8.13
Index numbers	100	77	90

It should be recalled at this point that both P.D.A.D. and the graduate student groups were allowed to complete the questionnaire at home. This may account for part of the extremely high level of anxiety in the B.Ed. group, although it tells us nothing about the graduate students' anxiety level which is also very high relative to groups of other nationalities.

Neuroticism is measured in terms of the degree to which the subject accepts a number of statements about himself (herself) which are also accepted by individuals who are mentally disturbed. There are few differences of significance in this variable. Younger students score higher in neuroticism in both P.D.A.D. groups, significantly so in the B.Ed. group. The B.Ed. students as a whole also score higher than the P.D.A.D. group, this may be a function of the fact that they are younger, on the average. Confirming expectations based on testing other groups, the female students score higher than male students in both the B.Ed. and P.D.A.D. student-teacher groups. Again, probably by virtue of the age differential, graduate students score at the same level as the P.D.A.D. group in neuroticism.

TABLE 10
NEUROTICISM

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	7.01*	5.44*	6.09*
Women	7.68*	7.11*	7.19*
17-25 years	7.59*	6.63	7.08*
26-35 years	5.85*	6.20	6.05*
1. Catholics	7.37	6.48	7.24
2. Orthodox	8.69	6.67	4.80
3. Anglicans	7.18	6.33	6.69
4. Protestants	7.25	6.07	6.74
5. Small Sects	7.62	6.65	6.31
6. Far Eastern	6.83	6.20	7.50
7. Atheists	7.71	6.95	6.51
1. Conservatives	7.48	6.74	6.20
2. Liberals	7.48	6.56	6.31
3. Socialists	7.18	6.52	6.57
4. Independent and None	7.66	6.48	7.45
Average	7.51*	6.55*	6.69*
Index numbers	100	87	89

Extraversion is a measure of the degree to which the respondent is oriented towards social relationships rather than towards solitary activities of an ego-centred character. It is one of only two of the thirty variables where no differences of any significance were found in the entire intake sample (Table 11).

In summary: apart from the extremely high anxiety level of the B.Ed. students (the highest ever recorded in any group), the intake shows a remarkable homogeneity in the areas of personality looked at—extraversion-introversion and stability-neuroticism. We were not surprised in this part of the study by the relatively higher score in neuroticism of the female students, it is a function of paper-and-pencil tests of neuroticism that women tend to score higher than men.

III. Personal Values

There are nine variables in this area, the score on each being derived from the choices made by the respondent of alternatives in a number of hypothetical situations such as buying a car, receiving a legacy, joining a

TABLE 11
EXTRAVERSION

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	13.76	12.54	13.75
Women	13.91	13.67	13.39
17-25 years	13.88	13.39	13.25
26-35 years	13.73	12.83	14.04
1. Catholics	13.87	13.45	13.06
2. Orthodox	14.69	17.00	14.60
3. Anglicans	13.03	12.11	12.31
4. Protestants	13.94	12.50	14.02
5. Small Sects	13.90	13.58	13.10
6. Far Eastern	13.00	12.40	15.00
7. Atheists	13.82	13.53	13.86
1. Conservatives	13.65	12.93	12.37
2. Liberals	14.05	13.40	14.40
3. Socialists	13.86	12.95	13.74
4. Independent and None	13.80	13.45	12.91
Average	13.87	13.29	13.56
Index numbers	100	96	98

club, entertaining friends, etc. etc. The choices are ranked so that the scores on the variables are not independent—a grand total of 72 points having to be awarded to each subject on the basis of the choices he (she) makes. Interest here is therefore concentrated on the *patterns* of values manifested by the choices, rather than in individual variables. It is a matter of alternatives, rather than of absolutes.

The nine values can be defined in general terms, as follows: *Freedom* is an attitude favourable to a desire to exercise independent judgment. *Helpfulness* refers to an attitude of caring for others in social, family and friendship activities. *Experience* is an attitude which favours having a variety of interesting contacts and new experiences for oneself. *Power* expresses an interest in exercising authority over others and in being associated with influential persons and organizations. *Recognition* is a value which measures the degree to which the respondent is concerned with acquiring prestige with friends and social approval in general. *Response* is a value which characterises the person who is interested in attracting people

and putting others at their ease. *Security* is a measure of the value placed on social and financial stability as the basis of individual comfort and enjoyment of a decent standard of living. *Submission* is a measure of the respondent's need for authoritative counselling by friends, teachers and experts generally. *Workmanship* measures the urge to perform adequately and to value skill and workmanlike qualities in others.

TABLE 12

FREEDOM

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	9.12*	8.76	9.52
Women	8.36*	8.78	9.05
17-25 years	8.59	8.78	9.13
26-35 years	7.81	8.80	9.48
1. Catholics	8.32	8.39	9.08
2. Orthodox	7.50	7.67	9.60
3. Anglicans	8.29	8.89	7.85
4. Protestants	8.09	7.71	8.53
5. Small Sects	8.37	8.50	9.62
6. Far Eastern	11.00	8.20	5.50
7. Atheists	10.16*	10.03*	10.30*
1. Conservatives	7.52*	7.30*	7.67
2. Liberals	8.60	8.87	9.36
3. Socialists	8.79	9.43	10.17
4. Independent and None	8.87	9.09	9.39
Average	8.55	8.78	9.27
Index numbers	100	103	109

The degree to which freedom is valued is an important discriminant. Men score significantly higher than women in the B.Ed. group; atheists score higher than other (religious) groups, except for those belonging to Far Eastern religions; Conservatives score much lower than other political groups in their expressed need for exercising independent judgment.

In the case of the B.Ed. students, the Conservatives also indicate a lower need for new experience: in contrast to their attitude to freedom and experience, they express a greater need for social and professional recognition. In the case of the P.D.A.D. Conservatives, they compensate for their lower evaluation of freedom of independent judgment by expressing a greater need for financial and social security. In the B.Ed. group, the

atheists compensate for their greater need for freedom by a lower score for the values of response and security. In the P.D.A.D. group they spread their choices in a more random fashion so that no differential pattern emerges.

TABLE 13

PERSONAL VALUE PATTERNS OF MEN AND WOMEN STUDENT-TEACHERS

Value	B.Ed. Students		P.D.A.D. Students		Graduate Students	
	M	W	M	W	M	W
n =	144	418	59	118	100	118
1. Freedom	9.12*	8.36*	8.76	8.78	9.52	9.05
2. Helpfulness	10.79*	11.33*	11.80	11.69	11.31	11.47
3. Experience	10.33*	10.77*	10.08*	11.38*	10.68	10.64
4. Power	4.68*	3.90*	5.36*	3.37*	4.66*	5.28*
5. Recognition	6.30*	5.75*	6.32	5.60	5.70	5.58
6. Response	6.00*	6.71*	6.15	6.42	6.05*	6.86*
7. Security	9.10	9.14	8.93	8.75	8.62	8.76
8. Submission	5.83*	6.40*	6.15	6.70	5.79*	6.36*
9. Workmanship	10.13	9.97	10.37*	9.58*	10.07	9.69

Men and women students in both groups show a different value-pattern. In the B.Ed. group men and women differ on seven of the values measured, in the P.D.A.D. group only on three. Women B.Ed. students are less interested in freedom, power and recognition than are men; they are more interested in helpfulness, new experience, response, and are more submissive than are the men B.Ed. students. In the P.D.A.D. group, women differ from men in being more interested in experience and less interested in power and workmanship. These differences between the value-patterns of B.Ed. and P.D.A.D. women versus men are probably due to the smaller numbers sampled in the latter group; in terms of the *direction* of differences on the nine variables the patterns as between men and women are the same.

In both student-teacher groups, the younger students are more interested in new experience; the older students are more interested in power and security.

In summary: there seems to be a considerable agreement about personal values within the two groups of student-teachers as well as between the two groups. The differences that do emerge are primarily related to the value of freedom which discriminates on the one hand between atheists and religious persons and between Conservatives and students of other political persuasions. Speaking relatively, and not in absolute terms, atheists overvalue freedom of independent judgment and new experience for themselves at the expense of their own social and financial security

TABLE 14
PERSONAL VALUE PATTERNS OF RELIGIOUS GROUPS

Value	Catho- lics	Ortho- dox	Angli- cans	Protes- tants	Small Sects	East- ern	Athe- ists	Av.
B.Ed. Students								
1. Freedom	8.32	7.50	8.29	8.09	8.37	11.00	10.16*	8.61
2. Helpfulness	11.17	11.81	11.09	11.33	11.17	10.83	10.87	11.32
3. Experience	10.50	10.81	9.97	10.76	10.54	10.17	11.11	10.71
4. Power	4.13	3.69	4.50	4.12	3.78	4.83	4.40	4.14
5. Recognition	6.17	6.66	5.70	5.88	5.76	5.83	5.46	5.88
6. Response	6.83	6.91	6.21	6.60	6.55	7.33	5.86*	6.48
7. Security	9.31	8.81	9.79	9.12	9.29	10.50	8.44*	9.06
8. Submission	6.06	5.50	6.53	6.36	6.54	7.17	6.10	6.32
9. Workmanship	9.91	10.28	10.41	9.90	10.31	10.00	9.70	9.97
P.D.A.D. Students								
1. Freedom	8.39	7.67	8.89	7.71	8.50	8.20	10.03*	8.61
2. Helpfulness	12.23	11.33	11.33	11.40	12.08	10.80	11.71	11.32
3. Experience	10.35	9.17	10.89	10.81	11.19	12.20	11.34	10.71
4. Power	3.84	5.67	3.67	4.33	3.81	4.40	4.48	4.14
5. Recognition	5.55	6.50	6.22	5.40	6.15	5.80	6.05	5.88
6. Response	6.74	6.00	7.11	6.12	6.54	5.40	6.16	6.48
7. Security	8.71	10.67	9.44	9.48	8.27	8.80	8.33	9.06
8. Submission	7.16	6.83	6.67	6.52	6.23	5.60	6.33	6.32
9. Workmanship	9.74	8.33	9.22	10.33	9.31	10.80	9.95	9.97

and social recognition. Conservatives undervalue freedom and new experience, giving their regard to recognition and security. It is probable that the differences between Conservatives and atheists are bound up more closely with their disparate social attitudes—in other words a large proportion of the atheists are also radicals and socialists.

IV. Social Attitudes

The two variables throwing light on social attitudes are conservatism-radicalism and tender vs. tough-mindedness. These have been shown to be the most basic measures in this area. *Radicalism* is defined as an attitude of antagonism to a great number of prevailing practices and opinions related to the preservation of social, class and institutional arrangements based on private ownership and a theory of social *élitisme*. Operationally it is defined in terms of the score on the inventory devised by Eysenck (as revised by the present author). *Tendermindedness* is defined in terms of the same instrument which gives a measure of the degree

TABLE 15
PERSONAL VALUE PATTERNS OF POLITICAL GROUPS

Value	Conservatives	Liberals	Socialists	Independents	Av.
<i>B.Ed. Students</i>					
1. Freedom	7.52*	8.60	8.79	8.87	8.61
2. Helpfulness	11.25	11.25	11.60	10.96	11.32
3. Experience	10.22	10.79	10.03*	10.94*	10.71
4. Power	4.11	3.90	4.29	4.23	4.14
5. Recognition	6.66*	5.71	5.75	5.79	5.88
6. Response	6.54	6.65	6.68	6.34	6.48
7. Security	9.55	9.14	9.32	8.87	9.06
8. Submission	6.26	6.30	6.16	6.23	6.32
9. Workmanship	10.20	9.90	10.10	10.01	9.97
<i>P.D.A.D.</i>					
1. Freedom	7.30*	8.87	9.43	9.09	8.61
2. Helpfulness	11.74	11.60	12.10	11.72	11.32
3. Experience	10.63	11.02	10.52	11.15	10.71
4. Power	4.52	3.94	4.33	4.36	4.14
5. Recognition	6.07	5.92	4.81	6.00	5.88
6. Response	6.30	6.42	6.29	6.27	6.48
7. Security	10.19*	8.58	8.48	8.57	9.06
8. Submission	6.41	6.58	6.43	6.54	6.32
9. Workmanship	9.11	9.69	9.76	10.30	9.97

to which the respondent is more concerned about individual (hard) cases, than about absolute standards of behavior and social legality. These two variables are the most discriminating of any in the battery of thirty. Most of the categories into which the students can be divided show significant differences in radicalism. Tendermindedness does not discriminate between the political groups, nor the age groups, but does with most others.

Liberals and Socialists are more radical than the other two groups in the P.D.A.D. sample; only the Socialists are more radical in the B.Ed. group, the others do not differ significantly. Atheists are more radical than the religious groups, the reason for this has already been stated as a hypothesis. Similar differences are found in tendermindedness (Table 17).

Here the differences lie between the group of Catholics and the others. Most of the differences can be explained in terms of the items which score for toughmindedness—sterilization of the “unfit”; absolute freedom of speech, press and stage; abortion on demand, easier divorce, “trial marriages” and birth control. Indeed, it is the amount of agreement as between the Catholics and the atheists which is surprising. The very low score of the Anglicans (lower than atheists in the B.Ed. group) is also surprising.

TABLE 16
RADICALISM

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	7.07	6.49*	7.92
Women	6.71	7.82*	8.01
17-25 years	6.79	7.14*	7.79
26-35 years	6.96	8.53*	8.25
1. Catholics	6.43	6.55	6.84
2. Orthodox	6.63	5.33	5.40
3. Anglicans	6.59	7.00	7.08
4. Protestants	6.71	7.24	8.32
5. Small Sects	6.35	7.00	7.48
6. Far Eastern	6.83	8.00	4.00
7. Atheists	8.24*	8.31*	9.27*
1. Conservatives	6.12	6.04	6.87*
2. Liberals	6.74	7.69*	7.97
3. Socialists	7.71*	8.00*	9.17*
4. Independent and None	6.84	7.43	7.84
Average	6.80*	7.38*	7.97*
Index numbers	100	109	117

IV. Educational Values

Closely related to the social attitude variables are the three measures of educational values devised by Oliver and Butcher—Naturalism-Idealism, Toughmindedness in Education and Radicalism in Education. In addition, five variables indicate the respondent's view of the proper function of the school—whether physical health and development, aesthetic development, scholastic activities, religious truth, or a utilitarian service to the community are most important. Like the personal values test, reported scores on the last five variables are interconnected, being based on the ranking of desirable alternatives by the respondent.

Naturalism in education is defined as an attitude which favors spontaneous development in children (Rousseauism), rather than a forced compliance with external or absolute standards (Platonic idealism). *Radicalism in education* is measured by the amount of change in the educational system the respondent is prepared to accept or advocate. *Toughmindedness in education* is a measure of the respondent's acceptance of a social utilitarian view of the curriculum.

TABLE 17
TENDERMINDEDNESS

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	5.73*	5.97	6.49
Women	6.45*	6.26	6.93
17-25 years	6.27	6.05	6.63
26-35 years	6.23	6.70	6.89
1. Catholics	7.07*	7.58*	7.80*
2. Orthodox	6.09	4.67	4.40*
3. Anglicans	5.29*	5.78	6.46
4. Protestants	6.16*	5.81	6.19
5. Small Sects	6.47	5.85	7.48
6. Far Eastern	5.17	6.40	7.50
7. Atheists	5.45*	6.00	6.25*
1. Conservatives	6.42	6.07	6.47
2. Liberals	6.29	6.15	6.84
3. Socialists	6.53	6.43	7.20
4. Independent and None	6.08	6.13	6.46
Average	6.27	6.16	6.73
Index numbers	100	98	107

The five educational values remaining are defined as follows: *Physical value* is characterized by an emphasis on the need for the school to make provision for physical exercise, games, fresh air, instruction in hygiene and health as a major priority.

Aesthetic value emphasizes creative achievement in art and drama, music, poetry, sculpture and on individual spontaneity in these areas. *Scholastic value* emphasizes intellectual matters. *Religious value* measures rather a fundamentalist attitude to "the true faith", moral tone, religious services, etc., in the life of the school. *Utilitarian value* emphasizes the school's part in producing "good citizens" and "practical" people. In the case of these five variables, a difficulty arises in that a different scoring system was used with the graduate students' responses. The *average* scores of this group have been adjusted to make the three groups comparable.

TABLE 18
NATURALISM IN EDUCATION

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	8.65	8.08*	10.13*
Women	8.87	9.75*	10.87*
17-25 years	8.85	8.97	10.37
26-35 years	8.08	10.27*	10.80
1. Catholics	8.59*	9.71	10.00
2. Orthodox	8.28	8.50	8.40
3. Anglicans	8.76	9.33	11.46
4. Protestants	8.89	8.52	10.39
5. Small Sects	8.35*	8.85	10.86
6. Far Eastern	9.66	8.40	9.50
7. Atheists	9.77*	9.67	10.94
1. Conservatives	8.09	8.33	9.63
2. Liberals	8.85	9.10	10.58
3. Socialists	9.21*	10.19	11.09
4. Independent and Others	8.96*	9.31	10.58
Average	8.81	9.19	10.52*
Index numbers	100	104	120

As far as naturalism in education is concerned, the differences are clear-cut and could have been predicted. Women are more naturalistic in their thinking than are the men student teachers. Graduate students are more naturalistic than the P.D.A.D. intake, and they more than the B.Ed. freshmen. The older students in the P.D.A.D. program are more naturalistic than the younger. Atheists are more naturalistic than Catholics. Socialists and Independents are more naturalistic than Conservatives.

In the case of Radicalism in Education, there are several strange anomalies, not readily to be understood. Conservatives seemingly are, on the average, more radical than the Socialists—indeed they are the people more than any other group, who desire most change in the educational system. Again, aside from the eleven students from the Far East, atheists are the most conservative of any of the religious groups, advocating least change in the educational system. Protestants and Catholics are relatively radical.

TABLE 19
RADICALISM IN EDUCATION

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	52.49	52.41*	64.25*
Women	51.55	49.33*	59.19*
17-25 years	51.83	51.10*	58.99*
26-35 years	51.00	46.70*	65.61*
1. Catholics	52.30	51.06	58.96
2. Orthodox	50.44	50.33	64.00
3. Anglicans	52.29	46.89*	59.92
4. Protestants	52.07	53.43*	59.33
5. Small Sects	52.62*	50.00	61.10
6. Far Eastern	49.17	42.60	79.50
7. Atheists	49.97*	49.12	65.21
1. Conservatives	53.99*	56.04*	60.07
2. Liberals	51.31	49.35	62.85
3. Socialists	50.93	46.33	64.26
4. Independent and Others	51.60	50.25	59.00
Average	51.79*	50.36*	61.51
Index numbers	100	97	119

Toughmindedness in education, which is in reality a measure of a utilitarian attitude to the curriculum, is relatively high in the B.Ed. group. Atheists and Socialists score low on this variable, Conservatives and Catholics score high (cf. Utilitarian value where these relationships are reversed).

In the variable Toughmindedness in Education, the group of atheists score significantly lower than do Catholics (and Protestants too in the P.D.A.D. group). B.Ed. students as a group are more inclined towards toughmindedness in education than either of the other two groups.

The only significant difference in the attitude to physical exercise and hygiene as a primary emphasis in the organization of the School lies between Conservatives in the B.Ed. group (who value it least) and those of no political allegiance (who value it most). Conservatives in both groups also place least value on the aesthetic function of the school. Women score higher than men in both groups in this variable. There are no differences between any of the categories of students in the variable schol-

TABLE 20
TOUGHMINDEDNESS IN EDUCATION

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	12.98	11.78	11.98
Women	13.61	12.29	12.50
17-25 years	13.50	12.25	12.62
26-35 years	12.42	11.47	11.67
1. Catholics	14.22*	13.61*	12.73
2. Orthodox	13.66	13.83*	14.60*
3. Anglicans	13.88	12.44	14.00
4. Protestants	13.48*	12.88	12.84
5. Small Sects	14.10*	12.31	12.14
6. Far Eastern	10.17	13.60	17.50
7. Atheists	11.36*	10.33*	10.71*
1. Conservatives	14.08	13.52	13.73
2. Liberals	13.36	11.60	12.35
3. Socialists	12.92	12.86	11.37
4. Independent and Others	13.45	11.81	11.96
Average	13.45*	12.12	12.26
Index numbers	100	90	91

astic value, except that graduate students score much lower than the other two groups. On the other hand, the differences are maximized in the case of religious value. B.Eds. score higher than P.D.A.D. students, and both much more than graduate students. Men score higher than women in the P.D.A.D. group. Atheists, Anglicans and Protestants score lowest in religious value in the B.Ed. group: in the P.D.A.D. the difference lies between Catholics and Atheists. Utilitarian value serves to distinguish only the Conservatives in the B.Ed. group from the other political groupings (they are slightly, but significantly more utilitarian) and men from women in the B.Ed. group. The P.D.A.D. group as a whole is more utilitarian in outlook than are the B.Eds. Thus the major contrasts in value patterns are in relation to *religious* and *aesthetic* values: groups tend to agree about the physical, scholastic and utilitarian functions of the School.

In summary: in terms of educational values the B.Ed. and the P.D.A.D. groups differ from each other in that the B.Ed. group desires slightly more change in the educational system, they take a more socially oriented and less individually oriented view of the curriculum, they place higher

regard on the religious function of the school and less on the utilitarian. This difference in attitude to the school as a total institution and towards the function of the different subjects in the curriculum of studies is very interesting, suggesting a liberalizing effect on attitude to subjects as a result of taking university courses. The B.Ed. students are more certain of their opinions over a whole range of topics and more dogmatic about those which they adhere to as individuals. These are the most interesting differences. The other major differences are between men and women in the two intake samples. Women are more certain of their views, they tend to be also more religious, more aesthetic and less utilitarian than men. Atheists seem to form a distinctive group, as do the Conservatives. Atheists tend to be more radical, less toughminded, more interested in the aesthetic and utilitarian functions of the school, and less in the religious. Conservatives are interested in major changes in the school (paradoxically), they value the physical side of the school's activities and function less than do others, they are significantly less interested in the creative and expressive arts in the school organization, they stress the religious function more.

TABLE 21
ATTITUDE TO PHYSICAL EXERCISE AND HYGIENE

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	26.84	27.00	20.33
Women	26.48	26.42	21.44
17-25 years	26.57	26.52	22.70*
26-35 years	26.46	27.07	18.05*
1. Catholics	26.85	27.84	21.04
2. Orthodox	25.00	25.17	23.20
3. Anglicans	26.26	26.67	17.54
4. Protestants	26.70	25.95	22.67
5. Small Sects	26.32	26.04	20.55
6. Far Eastern	26.33	26.80	12.50
7. Atheists	26.93	26.81	20.24
1. Conservatives	25.61*	25.26	21.23
2. Liberals	26.71	27.21	20.14
3. Socialists	26.29	25.48	20.71
4. Independent and Others	26.96*	26.96	21.93
Average	26.57	26.61	26.67 (Adjusted)
Index numbers	100	100	104

TABLE 22
AESTHETIC VALUE

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	28.79*	28.56*	22.38*
Women	31.02*	32.11*	26.83*
17-25 years	30.46	30.67	26.37
26-35 years	30.15	32.23	22.22
1. Catholics	30.03	29.10	26.98
2. Orthodox	30.03	31.67	22.20
3. Anglicans	30.73	28.56	24.38
4. Protestants	30.29	30.14	24.72
5. Small Sects	30.12	31.69	24.69
6. Far Eastern	32.67	29.80	24.50
7. Atheists	31.64	32.53*	23.81
1. Conservatives	28.89*	29.00*	22.40
2. Liberals	30.54	30.73	24.45
3. Socialists	31.04	31.10	24.40
4. Independent and Others	30.83	31.85	26.49
Average	30.45	30.93	31.75 (Adjusted)
Index numbers	100	101	104

IV. Relationships Between the Variables: Student Types

As was the case in previous studies of teachers and student-teachers, it is clear that certain core variables discriminate between the various categories defined in terms of age, sex, political affiliation, religious beliefs and the nature of the program being embarked upon. The same variables are those which are most closely related to each other in terms of correlation—positive or negative. The most significant of these are as follows: radicalism, punitiveness, formalism, freedom, security, naturalism in education, radicalism in education, uncertainty, aesthetic and religious values. These tend to correlate with each other ± 0.20 or greater.

A factor analysis of the 30 variables over all 739 students tested in the intake reveals eleven factors of significance. Between them they account for 63% of the total variance. These identify not only the nature of the attitudes and values in the group, and the ways in which these cluster together, they also categorize different types of students in the intake. Each of the factors classifies students into bipolar opposites, the characteristic of each type being specified by the size and relationships (positive or negative) of the saturation coefficients.

TABLE 23
SCHOLASTIC VALUE

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	34.57	34.78	27.59
Women	34.20	34.97	28.48
17-25 years	34.24	34.99	29.62*
26-35 years	35.31	34.53	25.55*
1. Catholics	34.41	34.39	28.61
2. Orthodox	34.44	35.17	31.00
3. Anglicans	34.59	36.67	29.00
4. Protestants	34.76	35.31	29.12
5. Small Sects	33.32	34.27	27.55
6. Far Eastern	34.33	36.48	23.00
7. Atheists	34.45	34.72	26.68
1. Conservatives	34.83	35.15	28.27
2. Liberals	34.23	34.68	27.45
3. Socialists	34.10	36.43	27.14
4. Independent and Others	34.18	34.55	29.27
Average	34.29	34.91	35.56 (Adjusted)
Index numbers	100	102	104

The first factor is the *conformism-nonconformism* dimension which appears with monotonous regularity in all groups tested with this instrument, the *Survey of Educational Opinions*. Here the factor accounts for 12% of the variability between individuals (variance) and shows heavy loadings in the ten core variables.

The second factor is a rather narrow *career-orientation* with high positive loadings on all four measures of job satisfaction as well as on formalism, toughmindedness in education, and high negative loadings on freedom and uncertainty. The third factor is recognizable as *altruistic idealism*—high in tendermindedness, response, submission and religious value and with negative loadings in power, utilitarian value, personal development and job satisfaction. The fourth factor is *scholarship* defined by high saturations in scholastic value, stability, introversion, helpfulness and workmanship and negative loadings in anxiety, recognition and response. The fifth factor is a *tough-conservative versus a tender-radicalism* factor. At the radical pole it is characterized by high anxiety, radicalism, tendermindedness, workmanship, naturalism, certainty; the conservative pole is marked by response, submission, uncertainty, physical value, emotional

TABLE 24
RELIGIOUS VALUE

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	27.57	28.31*	20.18
Women	28.06	25.30*	20.75
17-25 years	27.95	26.63*	21.73*
26-35 years	27.38	24.67*	18.47*
1. Catholics	28.32*	28.52*	24.06*
2. Orthodox	29.31*	26.50	22.00
3. Anglicans	27.85	27.44	20.80
4. Protestants	27.46	25.76	20.04
5. Small Sects	29.72*	27.50	22.38
6. Far Eastern	29.00	25.20	23.50
7. Atheists	25.25	24.96*	16.98*
1. Conservatives	28.96*	28.70*	20.77
2. Liberals	27.88	26.40	19.16
3. Socialists	28.38	24.29*	20.33
4. Independent and Others	27.36*	25.87	22.19
Average	27.93	26.30	20.49* (Adjusted)
Index numbers	100	94	95

satisfaction from being with children, professional development and job satisfaction. The sixth factor can be identified as an *experimentalism* which is rooted in traditional values. The factor has high loadings on experience, scholastic values, certainty, extraversion and formalism, with negative loadings in power, submission, religious and utilitarian values. The seventh factor is anxious religious idealism, perhaps better characterized as an *anxious fundamentalism*. The saturations are positive here for anxiety, workmanship, uncertainty, aesthetic and religious value, and negative for radicalism, submission, naturalism, physical exercise and utilitarian value. The eighth factor is *dependent submissiveness*. It is defined by high positive loadings in neuroticism, submission, utilitarian value and negative loadings in workmanship, physical exercise. This factor may simply be identifying the group of physical education types in the sample and contrasting them with an anti-physical group. The next two factors both refer to the personality make-up of the students. The ninth factor is a *stable-introversion versus neurotic-extraversion* dimension. The positive loadings are here in the variables anxiety, extraversion, neuroticism, security, scholastic value; the negative loadings are in punitiveness, power, radicalism in education, aesthetic value, personal development. The tenth

TABLE 25
UTILITARIAN VALUE

	B.Ed. Students	P.D.A.D. Students	Graduate Students
n =	562	177	218
Men	22.42*	22.68	14.88
Women	20.54*	21.70	15.90
17-25 years	20.98	22.09	16.97*
26.35 years	22.00	21.73	12.93*
1. Catholics	20.69	20.68	15.51
2. Orthodox	21.25	21.83	19.20
3. Anglicans	21.29	21.89	14.00
4. Protestants	20.95	22.67	17.17
5. Small Sects	20.66	20.77	14.45
6. Far Eastern	22.83	21.60	11.00
7. Atheists	21.82	22.93	14.38
1. Conservatives	22.18	21.93	15.87
2. Liberals	20.79	21.55	14.72
3. Socialists	20.74	22.52	14.43
4. Independent and Others	20.85	22.36	16.67
Average	21.02	22.03	19.60 (Adjusted)
Index numbers	100	105	93

factor contrasts *stable-extraversion versus neurotic introversion*. High positive loadings are here in anxiety, introversion, neuroticism, punitiveness, freedom, security; the negative loadings are in recognition, response and religious value. The eleventh and final factor can be identified as an *anxious individualism*. High positive loadings are found in anxiety, freedom and religious value; negative loadings are in submission, workmanship and emotional satisfaction.

Bibliographical Note

Full details of the instrument used in testing, norms for comparable populations and data on validity and reliability are available in the sources noted below. Copies of these reports are available from the author.

McLeish, J. *Teachers' Attitudes: A Study of National and Other Differences*. Cambridge, 1969.

McLeish, J. *The Lecture Method*. Cambridge, 1968.

McLeish, J. *Students' Attitudes and College Environments*. The University of Alberta Press, 1970.

REVIEWS

COGNITIVE PROCESSES IN EDUCATION: A PSYCHOLOGICAL PREPARATION FOR TEACHING AND CURRICULUM DEVELOPMENT

by Sylvia Farnham-Diggory

New York, Harper & Row, 1972, pp. xxxiv & 630, \$14.00.

While the idea of “educational psychology” has been bandied about for a good many years, there have been remarkably few instances of really good integrations of these two cultures. Far too many of the texts that have been labelled educational psychology have been anything but! They have been either educational in orientation, with an implicit Sunday supplement understanding of psychology, or psychological in orientation, with “obvious” statements made about education. Professor Farnham-Diggory manages to avoid these pitfalls and still do justice to the science of psychology and to the real world of education.

The basic premise is that good schools can be built on theoretically sound principles of psychology. The relevant principles according to the author are those of Bruner, Piaget, Werner and Robert White. In other words, this text is thoroughly “developmental” and “cognitive” in orientation—“learning theory” has no prominent place in its pages—and can best be seen as an attempt to provide teachers and curriculum planners with those psychological principles that would be of most help to them in the solution of their pedagogical problems.

To facilitate this effort, the author divides the principles into six major categories and these form the first six parts of the text: (1) basic cognitive development; (2) basic system of information processing; (3) motivation, personality and culture; (4) language; (5) reading and mathematical thinking; and (6) creative thinking. This is no grab-bag of cursorily surveyed common fare. The author has been judiciously selective in the choice of material. She uses those principles of cognitive psychology that are scientifically reliable and builds each part upon materials previously explained—the result is a book which has a constant cognitive theme throughout, and which is presented as an integrated whole. Each part has its own introduction, chapters and subsections emphasizing different aspects of the material, and a summary. It should also be re-emphasized, that whichever aspect of the material is being examined—basic sensorimotor development, basic systems of information processing, the emergence of symbolic thinking, programmes for organizing information, I.Q., competence and achievement, self-motivating learning cycles, group dynamics of the classroom, language and cognition, the role of the unconscious in the creative process, memory (there are many more)—the author is always concerned with classroom relevancy. This is especially evident in the seventh and concluding part. Here, the significant issues of the first six parts are incorporated into the design of an open school and pre-primary programme. The author does not attempt to offer a prescription that will solve all pedagogical problems; rather, she presents a way of looking at these

problems—a heuristic device, based on choice principles of cognitive psychology. She notes in the introduction that “these principles should help one to formulate the solution to one’s own pedagogical problems. But the final solution—and it should always be a temporary, dynamic one—must be a product of one’s own tests and revisions”. This book is worth reading, if for no other reason than to see what is possible when learned psychology and education come together and design a school.

Two further points. First, the part on language is very well done. The full range of topics found in most general texts on psycholinguistics is succinctly described and analyzed. This part could be incorporated readily into an intermediate level reader on that topic. Second, a *Study Guide* accompanies the text which it parallels in format. Each part contains programmed items, a do-it-yourself glossary, sample objective tests, matching items, questions for discussion, and small projects or experiments. Unfortunately, the guide is not of the same calibre as the text. Many of the questions and issues raised are perfunctory, neither challenging the reader nor rendering the text more understandable.

I have two criticisms of the text itself. First, it tends to be too esoteric in certain key places. The author apparently assumes that her readers are steeped in the cognitive tradition in psychology, therefore elaborate explanations of “everyday” basics would not be necessary. For example, a profound and complex concept such as Werner’s principle of *progressive differentiation and hierarchic integration* is briefly described on a single page. Yet this principle is cited throughout the text as if no further explanation were necessary, and its significance and import were general knowledge. In the same manner, certain fundamentals of Piaget’s and White’s views are presented. All of which means that, in certain instances, the basic themes of the text have to be supplemented by reference to other sources, which may or may not be so bad; but in any case, for the beginning student, the text cannot be readily understood.

My second criticism concerns things editorial. Bibliographical details are not always accurately cited. This is not a major issue. However, the uninitiated could have difficulty checking original sources.

Neither of these criticisms detracts from my overall impression of this book—it is at once bold, learned, and original. I concur with Jerome Bruner’s statement in the foreword: “This book represents a new departure in educational psychology”. *Cognitive Processes in Education* should appeal to the tyro and to the expert as well.

BRUCE BAIN



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FACULTY OF EDUCATION
The University of Alberta

LOIS FOSTER

and

MARY NIXON

The University of Alberta

Language, Socio-Economic Status and the School: An Exploratory Study

This study was designed to test the following hypothesis in Alberta: the higher the socio-economic status the more complex the use of language. Data were collected from 20 subjects located in two schools by means of three instruments—interview, essay and sentence completion. Contrary to the Bernstein (1961, 1966, 1971) theory of linguistic codes and the empirical work done by Lawton (1968) there were few differences between students from high socio-economic backgrounds and low socio-economic backgrounds. (Lois Foster and Mary Nixon are doctoral students in the Faculty of Education, The University of Alberta).

It has been posited by Bernstein (1966) that children from certain socio-economic backgrounds are handicapped in the school setting by lack of an 'elaborated code' type language. He suggests that middle class children are exposed to an 'elaborated code' which has distinctive, syntactical features as well as more cognitively abstract referential functions than the 'restricted code' of the lower classes. The absence of exposure to this 'elaborated code' in the lower classes is held to be influential in causing the poorer tested performance of the lower class on a number of intellectual tasks.

Lawton (1968:102) believes that Bernstein's theory is important in that "it relates social structure, verbal planning, language and educability." However, Moffit (1972) asserts that Bernstein's definitions of critical concepts are far from clear and that this limits the utility of the theory. Yet Bernstein's work has been influential in educational thought and many compensatory programs for the culturally deprived have been influenced by Bernstein's linguistic code conceptions.

Bernstein himself is careful to point out that the 'restricted code' is not so much 'inferior' as 'different'. He would appear to have little patience

with such programs as the one developed by Bereiter and Engelman (1968) which focuses upon teaching the 'elaborated code' as a second language to disadvantaged children. It is the school and the teacher rather than the child that must change.

Much of the contexts of our schools are unwittingly drawn from aspects of the symbolic world of the middle class, and so when the child steps into the school he is stepping into a symbolic system which does not provide for him a linkage with his life outside. (Bernstein, 1971: 199)

Despite the influence that Bernstein's work has had upon educators, the empirical support for his theory is derived solely from British research. Lawton (1968) and Taylor (1972) have both provided evidence that linguistic output is related to social class. However, this poses the problem of whether these results can be generalized from the British to the Western Canadian setting.

Complex use of language is associated with high socio-economic status (Bernstein, 1961, 1966, 1971; Lawton, 1968) and linguistic deprivation with low socio-economic status (S.E.S.). Taylor (1972) has stated that when this idea is applied to students in England "they may be assigned positions along a continuum from deprived to privileged, both socially and linguistically." In this study, carried out in Western Canada, the indicators chosen to assess complexity of language usage were an interview, an essay and an open-ended sentence completion test.

Method

In this study the null hypothesis tested was: That there is no difference in the complexity of language used as between students of high S.E.S. and low S.E.S. in two Edmonton Public Schools.

Subjects

Twenty Grade VII students were selected from two schools in Edmonton, Alberta. Ten of these—five boys and five girls—were drawn from a school in a prosperous suburb of the city. Only those with average I.Q. scores and from high socio-economic homes were selected. This group was then matched for age, sex, I. Q. and grade level from a school in the older part of the city, selecting only students from low socio-economic homes.

The socio-economic status of the students was assessed by the subjective evaluations of the school principals and by Blishen's 1967 Socio-Economic Index for Occupations in Canada. On this index the modal category for students in the high socio-economic group was 75.41, the range was 76.44 to 63.75. In the low socio-economic group the modal category was 30.47, the range being 40.14 to 29.26.

The sample of twenty students was divided into four groups:

- Group 1—5 boys of high socio-economic status
- Group 2—5 girls of high socio-economic status
- Group 3—5 boys of low socio-economic status
- Group 4—5 girls of low socio-economic status.

The Lorge Thorndike Verbal and Non-Verbal Tests of Mental Ability, administered in the spring of 1972, were used for I.Q. assessment. Elaborated code was operationally defined as ability on the test instruments

and restricted code was operationally defined as lack of ability on the three test instruments.

Instruments

The three tests were administered to all four groups. The first test consisted of a structured interview during which an independent observer assessed the non-verbal communication. Verbal responses were recorded on tape and later transcribed for purposes of inter and intra group comparisons. Students were then asked to give a written response in essay form to the question, "What do you think is the real purpose of education?" Responses were analysed for content by three independent judges in terms of an abstraction scale and a generalization scale. The written responses were further analysed to determine: (1) length (number of words written), (2) mean sentence length, (3) number of subordinate clauses, (4) number of subordinate clauses divided by finite verbs, (5) number of adjectives divided by total words, (6) number of adverbs divided by total words, (7) number of personal pronouns divided by total words, and (8) number of passive verbs divided by total words. The third test was comprised of ten incomplete sentences. In each successive sentence subjects were required to add an increased number of words. The sentences were analysed to determine: (1) total coordinations, (2) total subordinations and (3) total subordinate clauses divided by total finite verbs.

Two statistical tests appropriate to the written data were applied. With respect to the ratings made by the three judges of the essay test, use was made of a standard computer program for obtaining a one-way analysis of variance for inter-judge reliability. Interpretation of the analysis enables us to conclude that the difference between judges is not a systematic source of variation. The Mann-Whitney U Test was used on the written data to test the significance of inter-class and intra-class differences based on group mean scores.

Results

Interview

Lawton (1963:40) has pointed out that linguistic functioning differs as between written and oral language, and that a higher level of abstraction is required for written speech. Since this distinction does exist a structured interview was included. The interviews were evaluated for verbal content, fluency and non-verbal communication skills (i.e. gesture and facial expression).

From Table 1 it would appear that there is little overall difference within the categories of response between the groups. When the transcripts were examined it was equally true of all groups that colloquialisms as "yeah" and "like" were frequently used. For example:

High S.E.S. Girl 5: Yeah . . . he's a doctor.

Low S.E.S. Boy 3: She knew how to . . . like . . . have discipline.

High S.E.S. Boy 3: Well . . . then you don't know really like how smart or what your average is.

Low S.E.S. Girl 2: It's not fair to the other children . . . like . . . their answers and another person takes them from them.

TABLE 1
FREQUENCY DISTRIBUTION OF RATINGS
FOR STRUCTURED INTERVIEW, BY GROUP N=30

Group	Type of Question	Category of Response		
		Poor	Average	Good
1 (High S.E.S. boys)	Description	3	1	1
	Abstract	2	3	0
	Abstract moral	1	4	0
2 (High S.E.S. girls)	Description	4	1	0
	Abstract	5	0	0
	Abstract moral	1	3	1
3 (Low S.E.S. boys)	Description	4	1	0
	Abstract	5	0	0
	Abstract moral	1	3	1
4 (Low S.E.S. girls)	Description	3	1	1
	Abstract	2	3	0
	Abstract moral	1	4	0

There was no apparent difference between the groups in their ability to structure their language to provide a description of their family. For example:

High S.E.S. Boy 2: Well . . . we do a lot of skiing . . . lots of hiking . . . and I take music lessons. And my mom and dad and my brother we take karate lessons . . . and my two sisters take ballet . . . and we live down by Storyland Valley Zoo.

Low S.E.S. Boy 1: My mom works in the restaurant . . . and my dad does too and he goes to help my mom whenever he gets a chance. And my brother works at the restaurant and my other brother does too. And one sister is married.

The level of abstraction attained was approximately the same for all groups but the low S.E.S. participants expanded their points about teachers more than did the participants from the high S.E.S. groups.

High S.E.S. Girl 3: Well . . . she was kind to everyone . . . she made school fun.

Low S.E.S. Girl 4: He was an understanding teacher. He was very nice . . . he was very understanding. He'd ask us to do something but if we really didn't like to do it he would give us something else to do but we would have to do something.

A possible explanation of this greater elaboration is that for low S.E.S. students the teacher is a more important adult model.

There was a general lack of fluency exhibited by all groups. Despite this, however, gesture and facial expression gave a life to the interviews which cannot be communicated by the written transcripts. The high S.E.S. children accepted the interview situation without apparent strain. They gave the impression of being at ease with adults, answering freely, smiling

and relaxed in posture. The low S.E.S. students found the situation more novel and responded cooperatively. In general they were less at ease in the interview situation. This lack of social ease was displayed by restless feet, apprehensive facial expressions, erect spines and, in some cases, monosyllabic responses. One interesting exception was Girl 2 whose manner resembled that of the high S.E.S. students. Her transcript indicated that she was an only child and it is possible that she had had greater interaction with adults.

TABLE 2
AVERAGE NUMBER OF WORDS, MEAN SENTENCE LENGTH
FOR ESSAY, BY GROUP N=20

Group	Average Number of Words Written in 30 Minutes	Mean Sentence Length ¹
1 (High S.E.S. boys)	123.4	20.9
2 (High S.E.S. girls)	111.8	18.9
3 (Low S.E.S. boys)	76.8	24.1
4 (Low S.E.S. girls)	180.4	19.4

¹Total words divided by total number of sentences.

Table 2 shows the average number of words and mean sentence length for the four groups. One interesting aspect was the high S.E.S. boys wrote almost twice as many words as low S.E.S. boys whereas low S.E.S. girls wrote approximately 33 percent more words than high S.E.S. girls. It is also worthy of note that low S.E.S. girls had the highest average number of words of any of the groups. When the mean sentence length was examined, although Groups 2 and 3 wrote comparatively few words, Group 2 arranged the words in short sentences, Group 3 in long sentences. When the original essays were analysed it was evident that the additional length was not due to the ability to construct complex sentences but rather to the heavy reliance upon the use of coordinations.

For example:

Low S.E.S. Boy 2: So when you get older you can get a job because if you do not have a grade twelve education you will not get a job because when you go for a job one of the first things they ask you is if you were a dropout and if you were they will not let them work with you because they do not want a dropout working for them.

The Mann-Whitney U Test was used to test the hypothesis that there is no difference in complexity of language usage between the groups.

Comparing the use of different parts of speech and controlling the sentence length, there was no pronounced intra-class or inter-class difference between the groups. The only significant difference which appeared ($p = .02$) was between groups one and three in their use of adjectives.

TABLE 3
COMPARISON OF USE OF PARTS OF SPEECH FOR ESSAY, BY GROUP

Groups Compared	Passive/ Finite Verbs	Pronouns/ Total Words	Adverbs/ Total Words	Adjectives/ Total Words	Subordinations/ Finite Verbs
	u	u	u	u	u
1 v 2	10	8	9	7	5
3 v 4	11	6	11	12	11
1 v 3	10	9	8	2*	10
2 v 4	6	10	11	9	5
(1+3)v(2+4)	49.5	28	44.5	31.5	32
(1+2)v(3+4)	49.5	37.5	46.5	23.5*	38.5

*Only this difference between groups 1 and 3 is significant (at the 0.02 level)

Reliability, obtained from one way analysis of variance, indicates that when the experiment is repeated with another set of judges and the same subjects, the correlations between the mean ratings obtained from the two sets of data on the same test would remain approximately the same. Reliabilities obtained were generally acceptable at the 0.60 level and above. However, there were anomalies which might have been due to lack of detailed instructions calling attention to the fact that the scoring for the generalization scale and the abstraction scale were differently ordered.

Sentences

The sentence completion test provided little evidence of inter-class or intra-class differences in sentence construction. The linking of similar statements by such conjunctions as 'and', 'but' and 'so' (coordinations) were extensively used by all groups. Low S.E.S. boys used almost twice as many coordinations (44) as high S.E.S. boys (25). However, low S.E.S. girls resorted to their use with approximately the same frequency as high S.E.S. girls. (Low S.E.S. girls 36 coordinations; high S.E.S. girls 37 coordinations).

Subordinations, or the use of subordinate clauses (i.e. adjectival, adverbial clauses) were used most frequently by low S.E.S. girls (42) and high S.E.S. boys (38). As might be predicted from their heavy reliance on coordinations, low S.E.S. boys used the smallest number of subordinations (31).

Discussion

As has been mentioned previously, the purpose of the study was two-fold: (1) to add to the empirical evidence regarding Bernstein's theory of linguistic codes and (2) to discover whether a theory of class-linked

linguistic codes is appropriate to the Western Canadian setting. To assess differences in language usage between students whose fathers ranked high on a socio-economic index and students whose fathers ranked low on this index (Blisshen, 1967) written and oral indicators based on previous work (Lawton, 1968) were used.

When I.Q., age and grade level were controlled there were few significant differences in the complex use of language as between high and low S.E.S. students from two Edmonton Public Schools. This exploratory study indicated that there may be differences in the Western Canadian social structure which invalidate a direct application of Bernstein's conception of elaborated and restricted language codes. In the absence of other empirical studies, the following explanation is somewhat tentatively offered. The more fluid social structure of this youthful Canadian city places less emphasis on language as an indicator of social class.

In Britain social class still exerts a powerful influence on parental choice of school. Social class combined with differential schooling may therefore be productive of the language differences described by Bernstein. The students in this study were products of the same type of educational environment. The Edmonton Public School Board controls the schools within its jurisdiction. Although the two schools were located in different parts of the city they may be judged to be approximately the same in terms of teacher education, curricula, class size and school facilities.

It must be kept in mind that the sample was small, therefore the generalizations which can be made from the study are limited. One problem posed by research of this type is the detailed content analysis that is required. However, the findings of this exploratory study suggest the need for further research. Further insights might be provided by longitudinal studies to indicate the possible interaction of S.E.S. and age in language development and by using more refined indicators of differential use of language. In addition to these methodological aspects, an added dimension would be the comparison of language codes (restricted vs. extended) as between white and non-white Canadian groups, such as Métis and Indians.

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Ethnic Segregation in Toronto's Elementary Schools

The effect of ethnic residential segregation on school achievement has raised considerable debate in recent years. This study examines the question as it relates to the Toronto public elementary school system. Segregation indexes were calculated for each ethnic group and attempts were made to account for differences that we observed. Findings indicated that the Portuguese and Italian students were the most segregated while the Chinese and Greek students were least segregated. The Toronto study, although different in some respects from studies in American cities, seemed to indicate that Toronto's segregation patterns were similar to those in other North American cities. Conclusions regarding the effect of ethnic segregation on academic achievement were inconclusive. (Dr. Stephen B. Lawton and Mr. G. Patrick O'Neill are both in the Departmental of Educational Administration, O.I.S.E.).

School segregation as an outgrowth of residential segregation is an issue that has received considerable attention in North America, particularly as it concerns blacks and whites. However, segregation also exists among other ethnic minorities, as Taeuber (1966) has clearly illustrated. In extending the study of ethnic segregation to Canadian schools, this study has three objectives—the description of the pattern of school segregation for five major ethnic groups in the city of Toronto, the comparison of findings for Toronto with those for other North American cities, and the description of the relationship between the extent of segregation and the percentage of students in special education classes.

Background

In the late nineteenth and early twentieth centuries, Toronto, like many North American cities, experienced rapid growth caused by immigration from overseas. This growth resumed following World War II, yet because

of the emphasis in Canadian society on the concept of "multiculturalism within a bilingual framework," there has not been a strong demand for integration and cultural assimilation of minority groups, as has historically been the case in the United States (Clark, 1968; Ossenberg, 1971). As a result, Toronto has become a mosaic of special institutions serving the many cultural, political, social, economic and religious needs of a multi-ethnic clientele (Richmond, 1970).

In 1970, certain groups in the city of Toronto expressed concern that children from low socio-economic and immigrant families were disproportionately represented in special education classes. In response to their requests, the Toronto Board of Education conducted "The Every Student Survey" (Wright, 1970), in which literally every student in Toronto's elementary and secondary public schools was studied. The survey confirmed that certain ethnic groups were, in fact, over-represented in special education classes. The findings suggested that numerous factors might explain the program placement of students from different ethnic groups. Among these factors, Wright (1970) considered socio-economic status (occupational level), parental aspirations and the achievement values of the home environment. In a follow-up study, Wright (1971) reviewed other "critical factors" which, likewise, could account for the over or under-representation of certain ethnic groups in remedial courses. These included: parental attitudes, cultural frameworks and parental behaviours (models). In conclusion, he stated, "Culture, which includes beliefs, values and styles of living and learning, then seems to be a critical variable relevant to school success (p. 23)."

One variable not considered by Wright, although mentioned by Coleman (1966), is the effect of segregation on school achievement. Coleman found that children from similar family backgrounds, when enrolled in schools with contrasting social compositions, achieved at quite different levels. The effect was less for white pupils than for any minority group other than Orientals. Thus, "if a white pupil from a home that is strongly and effectively supportive of education is put in a school where most pupils do not come from such homes, his achievement will be little different than if he were in a school composed of others like himself (p. 22)." On the other hand, "if a minority pupil from a home without much educational strength is put with schoolmates with strong educational backgrounds, his achievement is likely to increase (p. 22)." In summary, Coleman noted, "the composition of student bodies has a strong relationship to the achievement of Negro and other minority pupils (p. 22)." The study reported here explores this relationship further in the Toronto public elementary school system, and attempts to answer the question, is the degree of segregation of students of different ethnic groups directly related to their academic achievement?

Methodology

The population investigated included the total elementary school population of Toronto's five major ethnic groups: the Chinese, Greek, Italian, Portuguese, and English-speaking Canadians. To fulfill the three objectives of the study, the following procedures were followed. First,

“index of dissimilarity” values were calculated to provide a description of the degree of separation in the schools between each pairing of the five ethnic groups. The index of dissimilarity (denoted by the letter D) ranges on a continuum from 100, which denotes complete separation between two groups, to zero, which denotes no separation (Lawton, 1972). Also, “index of segregation” values (denoted by the letter S) were calculated to measure the separation of each ethnic group from “all other” groups considered in the study (Bojean, et al. 1967). The index of segregation is similar to the index of dissimilarity except that one group is compared with *all* other groups combined, rather than with just *one* other group. Second, to establish whether or not Toronto’s ethnic minorities were more, equally, or less segregated than those in other North American cities, findings for Toronto were compared with data reported by Taeuber (1966). And third, the relationship between each group’s degree of isolation and their representation in special education classes was established by computing the Spearman Rank-Order Correlation Coefficient between segregation index values and percentages in Special A (opportunity, academic vocational, and pre-vocational) classes.

Results

The findings, reported in Tables 1 and 2, reveal three facts about the extent of school segregation. First, the two groups most highly segregated from English-speaking Canadians are the Portuguese (D = 72.8) and the Italians (D = 69.7). Second, both the Greek (D = 44.8) and Chinese (D = 43.8) students are moderately segregated from the English-speaking Canadians. Finally, the index of segregation indicates that, overall, both Portuguese (S = 63.7) and Italian (S = 65.3) students are more segregated from all others than are either the Greek (S = 38.2) or Chinese (S = 46.7) students; English-speaking students (S = 53.4) fall somewhere in between.

When the Toronto results are compared with values reported by Taeuber for cities in the United States, the most apparent feature is the similarity of results. Index values in Toronto ranged from a low of 38.2 to a high to 76.3, with the majority falling between 50 to 70. Excluding blacks,

TABLE 1
DISSIMILARITY INDEX VALUES FOR THE FIVE MAJOR
ETHNIC GROUPS IN TORONTO ELEMENTARY SCHOOLS

	English	Chinese	Greek	Italian	Portuguese
English	-	43.8	44.8	69.7	72.8
Chinese	43.8	-	56.9	76.3	68.6
Greek	44.8	56.9	-	53.9	67.6
Italian	69.7	76.3	53.9	-	63.9
Portuguese	72.8	68.6	67.6	63.9	-

TABLE 2
RANK ORDER CORRELATION BETWEEN SEGREGATION INDEX VALUES
AND PERCENTAGES IN SPECIAL A CLASSES, 1970

Ethnic Group	Segregation Index Value	Percentage in Special A
Greek	38.2	2.06
Chinese	46.7	1.01
English	53.4	4.41
Portuguese	63.7	3.00
Italian	65.3	4.28

$r_s = .60$ $p < .20$

Taeuber's values for D ranged from 37.3 to 76.2, with the majority also between 50 and 70. However, confidence in these conclusions is somewhat weakened by certain differences between the two studies. First, the units of analysis used in Toronto differ from those used by Taeuber. Second, the Toronto study is based on data collected in 1970, whereas Taeuber's data were collected between 1940 and 1960. Third, "The Every Student Survey" based its classification of ethnic group upon language, whereas Taeuber used the race of parents or surname nationality as the criterion. Finally, the Toronto survey considered only the individual child, while Taeuber studied the family unit. The similarity of Lawton's (1972) findings in Detroit to those of Taeuber—though Lawton's methods were similar to those used here—suggests it is reasonable to assume that the effect of these factors is relatively small. Thus, tentative evidence indicates that the pattern of minority group school segregation in Toronto is similar to that in other North American cities.

The Spearman Rank Order Correlation Coefficient between the index of segregation and the percentages in Special A classes equaled .60, for which $p < .20$. The strength of the relationship is not sufficient to confirm the existence of a statistically significant relationship between segregation and academic achievement. Yet, in view of the question's many important social implications, stronger evidence is needed before one can conclude that the relationship does not exist.

Discussion of Findings

The variation in the extent of segregation for the five groups, and in particular the high index values for Italians and Portuguese and low values for Chinese and Greeks, needs some explanation. In the popular view, all groups are considered to be concentrated in ethnic communities, yet the data reveal that the latter two groups are actually less segregated from others than are their English-speaking hosts.

The high Italian and Portuguese index values may be partially explained

by economic factors. Richmond (1970) found that the Mediterranean group, which includes Italy and Portugal, had the lowest level of education of all post-war immigrants into Canada, thereby making it difficult for many members of both groups to find employment in any but unskilled and semi-skilled vocations (Queen's Printer, 1965; Ferguson, 1966; Jansen, 1971). These jobs result in low earnings and make the individual vulnerable to unemployment (Richmond, 1967; Jansen, 1971). It becomes necessary for members of these groups to find inexpensive housing to compensate for their low incomes, thereby limiting them to few residential areas. Heavy concentration of Italian and Portuguese immigrants in particular neighbourhoods is then reflected in school attendance patterns.

The sponsorship system, whereby a Canadian resident ensures that the potential immigrant will not become a public ward, may be another factor which helps to explain heavy concentration of particular ethnic groups. Richmond (1967) believed that the system was particularly important in the case of Italians, since few were eligible for open-placement immigration to Canada which generally requires that an individual will be well-educated and highly skilled. The sponsorship system "strongly [encourages] . . . immigrants to live in the same community and sometimes in the same household as the sponsor (p. 11)." Again, the result is limited geographical areas in which families of Italian origin can find suitable housing.

To help explain the lower Greek and Chinese dissimilarity indexes, it is necessary to examine their respective histories. According to Xenides (1922), the Greeks are noted for placing a high emphasis on education. As a consequence, the second generation usually aspired to the professions (Saloutas, 1964), which in turn, has meant a rapid naturalization of Greek immigrants (Warner and Srole, 1945; Roucek, 1949). Saloutas (1964), in commenting on the rapid integration of the Greek immigrants stated, "The average member of the second generation rarely concerned himself with issues relating to Greece Interest in modern Greek culture was also at a minimum, despite the efforts of the Greek press, church leaders, and influential laymen. The majority of the youth were too absorbed with the American way of life and their own personal problems to give thought to Greek letters and learning (p. 325)." Saloutas continued, "What the Greek Church, the Greek language press and Greek travel agencies wished to encourage . . . the rank and file members of the second generation preferred to avoid. They were in America and it was their country. They just did not care about Greek culture in any of its forms (p. 325)." Much of what Saloutas claims is substantiated in *The Canadian Family Tree* (Queen's Printer, 1967) which notes that the Greek communities in both Montreal and Toronto are no longer closely knit groups but have tended to expand into the wider Canadian society.

Kung (1962) and Lai (1971), in discussing Chinese integration, divided the Chinese population into two factions—the "new immigrants" and the "old immigrants". Lai (1971) noted that the new Chinese immigrants differed greatly from the Chinese immigrants who came to Canada in the nineteenth century. The "new immigrants" came from the cosmopolitan, international city of Hong Kong instead of from agrarian villages in Southern China, and "their life style and attitude to traditional Chinese

values and norms were either in a state of flux or had already been changed before coming to Canada (p. 139)." Whereas the "new immigrants" made their permanent homes in Canada, the earlier Chinese immigrants "hoped to go back to retire in China as soon as they earned enough money (p. 121)." Thus, many of the old Chinese groups cherished their former values, customs and traditions; they had no desire to integrate for fear of losing their cultural identity. On the other hand, the new Chinese immigrants, being more highly educated and having undergone changes due to industrialization and urbanization in Hong Kong, have fitted into the broader Canadian scene. Lai (1971) found that only thirty-four per cent of her sample of new Chinese immigrants settled in Chinese residential areas; the rest were scattered over different parts of Metropolitan Toronto. She concluded that "this new group of Chinese immigrants appears to be more 'at home' in Canadian society than their nineteenth century precursors (p. 139)." Kung (1962) also noticed a disparity between the old and new immigrant groups. He found that although youngsters of the "old immigrant" families still speak Chinese at home and attend Chinese schools after regular school hours, the children of the "new immigrant" families usually speak little Chinese even at home. Kung (1962) attributed his finding to the fact that "most of the 'old immigrants' tend to be more conservative and think it wise and proper to have their children know something about Chinese culture, especially, the Chinese language (p. 57)."

Thus, it appears that many of the Greek immigrants and certain segments of the Chinese population have had a strong desire to integrate and mix with members of the dominant culture. This, no doubt, helps to account for the lower Chinese and Greek dissimilarity indexes.

Conclusions

The results of this study do not imply a need for a sweeping policy to desegregate Toronto's ethnic groups. It appears that both existing ethnic segregation and the uneven enrollment of ethnic groups in special education classes reflect variations in the cultural background of Toronto's public school students. At the same time, the moderate relationship between segregation and enrollment in special education classes does suggest that administrators would be wise to consider ethnic desegregation a desirable objective whenever it is necessary to bus children away from a crowded or antiquated school.

In summary, this study determined that the extent of ethnic segregation in Toronto is similar to that of ethnic groups (other than blacks) in the United States. Italian and Portuguese students are most segregated—and most highly represented in special education classes—while Chinese and Greek students are least segregated—and least represented in special education classes. Both the extent of segregation and enrollment in special education classes appear to be manifestations of many fundamental social, cultural and economic factors.

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An Investigation of Open-Book and Closed-Book Examinations in Mathematics

Differences between examinations set in an open-book setting and a closed-book setting were studied. Student achievement scores were found to be significantly higher on open-book examinations for some sub-scores and total test scores. Students were significantly less anxious in the open-book setting than in the closed-book setting. There was no significant difference between attitude to open-book testing and closed-book testing in this study. However, generally there was a significant relationship between achievement and attitude values but not between anxiety values and achievement. Little difference existed between the values for test variance, reliability and validities between the two settings. (Dr. Kieren is Associate Professor in the Department of Secondary Education, The University of Alberta. Mrs. Michaels is Test and Measurement Consultant, Edmonton Public School Board.)

Evaluation is a critical issue in education today. For an evaluation process to be successful, appropriate means of obtaining or measuring information must be used. The development of such measurement instruments and the selection of appropriate test settings is still lacking for many evaluation processes. This paper is concerned with the effects of test settings on the evaluation process.

The questions that were considered in this study dealt with group examinations written in open-book and closed-book settings. A general definition of an open-book setting is one where textbooks, notes and additional references may be used by the student as he writes the examination. This setting contrasts with the closed-book examination setting where the student is required to answer the questions from memory without the use of any external aids. Some practitioners have long contended that open-book examinations produce higher achievement. They feel that such practice would make examinations a "cinch". At the opposite extreme

others have contended that lower total achievement would result since students would waste time looking up information. For these and other reasons, open-book examinations have not found their way into mathematics teaching practice.

In response to this situation, this study addressed itself to the following specific questions.

1. Do examinations written in an open-book setting, as contrasted with those written in a closed-book setting, provide a different assessment of the high school student's achievement in mathematics? That is, does his achievement differ between the two settings?
2. Does a student's level of anxiety differ in the two settings?
3. Does a student's attitude to the two settings differ?
4. Is there a relationship among attitude, anxiety and achievement in a particular setting?
5. Does the reliability, validity and variance of examinations vary between the two settings?

Findings from the Literature

Group examinations, written in an open-book setting, have been used sporadically over the years in North America. Stalnaker and Stalnaker (1934) published an article on a three hour open-book examination at the University of Chicago. Additional studies have been completed on university populations since that time (Tussing, 1951; Furst, 1958; Kalish, 1958; Feldhusen, 1961; Marco, 1966). Major findings resulting from the investigations of these individuals were:

1. No change or a slight increase in achievement resulted when open-book examinations were administered. (Kalish, 1958; Feldhusen, 1961; Marco, 1966)
2. Students liked open-book examinations better. A possible reason given is that they were less anxious. (Tussing, 1951; Feldhusen, 1961; Marco, 1966)
3. Sounder study preparation resulted when open-book examinations were administered. (Tussing, 1951; Furst, 1958; Feldhusen, 1961)
4. Different abilities were tested in the open-book examination. Students were not tested on memory only, but also on reasoning. (Tussing, 1951; Furst, 1958; Kalish, 1958; Feldhusen, 1961)
5. Slight increases in validity, variance and reliability values were found in open-book set examinations over closed-book set examinations. (Marco, 1966)

Implications from these findings for the current study can be made only tenuously. None of the studies considered dealt with secondary school students and most were based on the author's reactions as a teacher using a particular examination type. Both of these limitations are suggestive of the need to conduct the type of study described here.

Research Design

The present study involved over 600 Mathematics 30 students, selected on a sampling basis from the province of Alberta at the grade XII level.

The students were randomly assigned to four groups by classroom lot. All participating classrooms were heterogeneous and contained a random sample of Mathematics 30 students in their school. Each group had a different order of setting and test forms to prevent any systematic differences occurring because of order of administration. The following data were collected for each student.

- (a) open-book test score
- (b) closed-book test score
- (c) neutral, open and closed anxiety scores
- (d) open and closed attitude scores to testing
- (e) attitude to mathematics score

The "anxiety scales" (Marco, 1966) were administered in a neutral setting not involving testing and then immediately prior to each of the test settings. The "attitude to testing" scales were administered immediately after each of the test settings. The "attitude to mathematics" scale was administered in a neutral setting between the two testing sessions. The two testing sessions were approximately one week apart.

Both tests the students wrote were parallel and contained 36 items. The thought levels represented in the items were knowledge, comprehension and application (Avital and Shettleworth, 1968).

It should be noted that this study does not seek to explore the parameters of an ideal open-book test. The open-book setting here is a very conservative one—that is, the test is a multiple choice examination designed for closed-book testing. If the data show differences in achievement attributable to test setting, since in this instance the variation in test setting is minimal, it could be concluded that using test instruments more appropriate to the open-book setting would produce still greater differences.

Results

Total test statistics such as variance, reliability and validity were considered in this study. Results showed no significant differences between the two test settings. For example, comparison of total test reliabilities showed that they did not differ by more than .05 between the Spearman-Brown "*r*'s" for the two settings. Thus, this study has shown the two settings to produce examinations of similar variance, reliability and validity.

The effects on achievement due to settings was analyzed using a three-way analysis of variance. This analysis considered the relationship of student achievement to the time of administration, setting and test form. It was found that there was no interaction between time of administration and setting or test form and setting. Hence, it is instructive to look at the main effect of the setting as indicated in Table 1.

A significant difference existed in all cases except for the Application sub-test. A number of possible explanations could be given. First, the students may have found the application questions too complex or unrelated to specific details in their notes or textbooks to receive significant help when they were writing the open-book examinations within the time given. Thus, the application section may have been effectively closed-book in either instance. Second, the very nature of application questions

TABLE 1
MAIN EFFECTS OF EXAMINATION SETTINGS

Effects	Knowledge Items	Comprehension Items	Application Items	Total Test Items
Setting				
Open	73.79	64.80	56.62	62.43
Closed	65.27*	61.64*	56.78	60.03*

*Significant at $p = .05$

indicates the student normally is not able to find the ready-made answers in his notes. The student is required to apply what he knows to a new situation.

Each testing period, the students filled out the Anxiety Differential with responses indicating their feelings about the approaching test they would write. The anxiety scale mean scores for the three times are indicated in Table 2. Student test anxiety was highest for students before writing a closed-book set examination and lowest in the neutral setting. Pairwise analysis of these means showed them to all be significantly different from one another, each with $p = .05$.

TABLE 2
COMPARISON OF ANXIETY SCALE MEANS

Setting	Mean
Neutral	45.368
Open	48.019
Closed	49.376

When the attitudes to open- and closed-book examinations were compared, no significant differences were found. The data for the comparison are given in Table 3. It appears that the student who has a favourable attitude to one test setting also has a favourable attitude to the other test setting.

TABLE 3
COMPARISON OF OPEN AND CLOSED-BOOK
ATTITUDES TO TESTING

Source of Variation	SS	DF	MS	F-ratio
Between People	280,911.0	451	622.862	
Within People	33,313.0	452	73.701	
Treatment	28.0	1	28.000	0.379
Residual	33,285.0	451	73.803	
TOTAL	314,224.0	903		

$p = .05$ $n = 452$

A series of regression equations were structured to determine the relationship of achievement to the attitude and anxiety variables. The equations showed that the attitude variables—attitude to open-book testing, attitude to closed-book testing and attitude to mathematics—were significantly related to achievement. Anxiety variables did not contribute any added prediction value to the regression equations. The variables listed in Table 4 represent most of the accounted for total test variance.

TABLE 4
USEFUL VARIABLES FOR PREDICTING ACHIEVEMENT

	Form A (Open)	Form A (Closed)	Form B (Open)	Form B (Closed)
Percent Variance of Total Test Accounted	29.79%	12.87%	16.18%	23.89%
Significant Variables on Total Test	Math Attitude Open-Book Attitude	Closed-Book Attitude	Math Attitude	Math Attitude
p = .05				

The primary results of the study can be summarized as follows:

- (a) Achievement scores were significantly higher on open-book examinations for knowledge item, comprehension item and total test item scores. No significant differences were found for application item scores.
- (b) The students were significantly more anxious in a test situation (either open- or closed-setting) than in the neutral setting. They were significantly less anxious in the open-book setting than in the closed-book setting.
- (c) There was no significant difference between attitude to open-book testing and closed-book testing.
- (d) There was a significant direct relationship between achievement and attitude values but no relationship between anxiety values and achievement.
- (e) Little difference existed between the values for test variance, reliability and validities between the two settings.

Implications

There are several implications for practice which can be drawn from this study of the simple effect of allowing students to write open-book examinations. Let us consider the three major areas, achievement, anxiety, and attitude.

The data seem to indicate that the open-book setting will increase achievement as measured by test score. Thus, if one wishes to allow his

students a greater measure of success, an open-book test composed of mainly knowledge and comprehension thought level items would be valid. However, if the test was on objectives requiring the mathematical process of application, either an open or closed-book setting would be appropriate since there would be no significant difference in achievement.

Many studies on achievement of various types note an optimal level of anxiety as productive of the best achievement. The closed-book setting resulted in the highest level of anxiety. This study indicates that an open-book setting results in a small but significant reduction in anxiety than does the closed-book examination. This open-book anxiety mean was, however, significantly greater than the neutral setting mean anxiety score for students. While much further and specific study needs to be done, these data are suggestive of an hypothesis that open-book settings can be conducive to a more nearly optimal level of anxiety or stress.

There is some evidence in the data to suggest that one's attitude to the type of examination is predictive of one's achievement on the examination. This finding may be a simple artifact of the students' ignorance of open-book examinations. However, if these data are supported by subsequent findings, this would indicate that the implications above with respect to achievement and anxiety could not be applied universally. That is, one might expect to find individualized reactions to open-book examinations in terms of achievement, with different individuals achieving best in different settings. With the increase in individualized programs, different ways of evaluating a unit of work should be open to the student.

Should mathematics teachers use open-book examinations? The data above suggest that such examinations are a legitimate and sometimes preferable alternative to most current practice in Alberta secondary school mathematics. How can they be used most effectively? What are the best forms of open-book examinations? These are questions left for further research: "action research" of mathematics teachers and students in classrooms, and research on variations of the open-book setting and other measures of achievement, attitude and stress.

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Personality Characteristics of Male and Female Prospective Teachers: A Multivariate Analysis

The primary purpose of this study is to test the multivariate null hypothesis that the personality characteristics of three groups of prospective teachers—female elementary, female secondary, and male secondary—do not differ. The dependent variables actually consisted of two sets; nine variables derived from Rogerian personality theory and twelve variables which measure Jungian type characteristics. Ss were 365 juniors and seniors in a large state university in the southwest region of the United States. Multiple discriminant analysis of the data results in rejection of the null hypothesis for the Rogerian based personality characteristics. When the Jungian type characteristics constitute the dependent variables, the results are equivocal. (Dr. Richek is Associate Professor at the School of Social Work, University of Oklahoma.)

That the teacher/child relationship is a crucial one from the point of view of the affective and cognitive growth of the child appears to be universally accepted (Peck and Richek, 1967). Sexton (1969) recently re-introduced the hoary issue of sex of the teacher; in her opinion, "more virile males . . ." (p. 193) are needed as teachers—at all levels—to counteract an alleged "feminizing" influence on American youth of female teachers. The Sexton (1969) book apparently pays no heed to the findings on this issue of Ryans' (1961) monumental work viz *that in the elementary schools there are essentially no differences in "productive" pupil behaviors* whether the teacher is male or female. However, at the secondary school level "productive" pupil behaviors are more evident when the teacher is female (Ryans, 1960).

Since this paper does *not* relate to the differential impact on the teacher-child relationship of the sex of the teacher or child, the review of the literature on this issue must perforce be truncated. The primary purpose of this paper is to test—using multiple discriminant analysis—the ". . . generalized, multivariate null hypothesis . . ." (Cooley and Lohnes, 1962, p. 119) that three groups of prospective teachers—female elementary, female secondary, and male secondary do *not* differ on two sets of personality

variables¹—one set derived from Carl Rogers' theory of personality (Rogers, 1959) and the other from C. G. Jung (1923).

Methods and Procedures

Instruments

In a southwestern university in the U.S., students who seek teaching certificates are required to complete a personality assessment packet at the point of declaring their intention to seek teacher certification, which generally is at the beginning of the junior year of college. This practice is in accord with the early personality screening requirements instituted by a large number of teacher training institutions (Miller, 1963). Among the evaluative instruments included in the packet at the time the data for this study were collected were:

A. *The Bown Self-Report Inventory (SRI)*. The SRI is designed as a straightforward self-assessment instrument in which subjects can record their own perceptions and feelings toward themselves and significant areas of their phenomenal worlds. In contrast to many other self-descriptive instruments which are constructed in such a way that an index of self-acceptance or, at most, indexes of acceptance of self and others are the only scores obtainable, the SRI yields multiple scores representing positiveness of attitude toward various segments of the phenomenal world. The theoretical background of the instrument is Rogerian: the central construct is that human behavior is determined by an individual's perceptions of the self and of the situation in which the individual is involved and his relations to significant others and to his environment. These form a configuration known as the phenomenal self.

A more detailed description of the SRI, including a summary of reliability and validity data, appears elsewhere (Bown and Richek, 1967). A brief statement of the scale descriptions follows: the SRI (Form R3) is made up of 48 items representing eight logically distinct areas of the "phenomenal world." These are:

1. *Self*. Items express acceptance, liking, or valuing of oneself—or the opposite.
2. *Others*. Items express acceptance, liking, or valuing of peers of the importance of satisfactory relationship with peers to one's own sense of well-being—or the opposite.
3. *Children*. Items express acceptance, liking, or valuing of children or the satisfaction derived by the subject in relationships with children—or the opposite.
4. *Authority*. Items express acceptance, liking, or valuing of older persons outside the family who are in positions of authority with respect to the subject—or the opposite.
5. *Work*. Items express a valuing of work or accomplishment in terms of its intrinsic or self-enhancing satisfaction to the subject—or the opposite.

¹ If the writer may be permitted to express a *personal opinion*, it is that far more important than the sex of the teacher are the teacher's personality characteristics, especially those which conduce toward acceptance and valuing of children on all dimensions—affective, cognitive, conative.

6. *Reality*. Items express acceptance or valuing of life as a process (including death) and feeling at home in and relatively comfortable with a not always predictable world—or the opposite.
7. *Parents*. Items express acceptance, liking, or valuing of one's own parents or the importance of one's relationship with parents to his own sense of well-being—or the opposite.
8. *Hope*. Items express an optimistic anticipation of the future or a sense of confidence that one will play a significant and satisfying role in future relationships and undertakings—or the opposite.
9. *Total*. The sum of all subscores which may be construed as the positiveness of the respondent's perceptions of his phenomenal world.

Subjects respond to each item by indicating on a five-point scale (running from "very much like me" to "very much unlike me") the extent to which the item expressed their own feelings and attitudes. The inventory yields eight subscores representing positiveness of attitude in each area and a total score (the sum of all subscores).

B. *The Myers-Briggs Type Indicator (MBTI)*. (Myers, 1962.) The MBTI yields eight scores which provide measures of Jung's (1923) typology

1. Extroversion
 2. Sensing
 3. Thinking
 4. Judging
 5. Introversion
 6. Intuition
 7. Feeling
 8. Perceiving
- and four so-called "continuous scores"
9. Extroversion/Introversion
 10. Sensing/Intuition
 11. Thinking/Feeling
 12. Judging/Perceiving.

Subjects and Statistical Techniques

Scores on the SRI and MBTI variables were available on 70 males (all seeking secondary school certification), 65 female elementary education majors, and 300 female prospective secondary school teachers. There were no significant differences among the three groups on any important demographic variables, e.g., age, socioeconomic status, etc. Data were analyzed via the computer program for multiple discriminant analysis described by Veldman (1967, pp. 268-279). Briefly stated, multiple discriminant analysis is a statistical technique whereby two (or more) groups of Ss "... may be differentiated by a set of dependent variables operating together . . ." (Veldman, 1967, p. 68). In this paper, the three groups were compared for two separate sets of dependent variables: (1) the nine SRI variables and (2) the twelve MBTI variables. The multiple discriminant

analysis program also compares univariate analyses of variance for each of the original variables (nine for the SRI and twelve for the MBTI).

Results and Discussion

TABLE 1
F RATIOS FOR THREE GROUPS

Variable	Means			SD			F ratio
	Sec. Fem. (N=300)	Elem. Fem. (N=65)	Males (N=70)	Sec. Fem. (N=300)	Elem. Fem. (N=65)	Males (N=70)	
<u>SRI</u>							
Self	19.43	20.45	19.09	3.86	4.07	3.36	2.45
Others	20.19	21.55	19.33	2.92	2.13	2.82	10.92
Children	17.30	21.99	16.06	4.52	2.42	4.77	38.22
Authority	18.63	19.59	17.77	3.27	3.16	3.13	5.32
Work	16.77	16.91	15.79	3.79	3.28	3.93	NS
Reality	16.71	16.66	15.79	3.35	3.34	2.76	2.34
Parents	18.76	20.06	18.34	5.24	5.22	5.16	NS
Hope	20.16	21.35	20.11	2.83	2.48	2.93	5.10
Total	147.95	158.55	142.27	17.39	16.41	17.27	15.78
<u>MBTI</u>							
Extraversion	14.97	17.48	15.19	6.48	6.32	6.73	4.02
Sensation	13.24	13.40	14.13	7.69	7.16	7.90	NS
Thinking	7.49	8.38	10.39	4.95	5.74	5.23	9.19
Judging	16.15	18.08	17.44	6.36	6.16	6.47	3.12
Introversion	3.09	3.65	6.26	6.21	6.17	8.12	6.63
Intuition	10.86	10.11	10.19	6.28	5.54	6.37	NS
Feeling	12.65	12.06	9.36	4.81	5.33	5.27	12.48
Perception	10.48	8.52	9.05	6.35	5.91	6.64	3.40
E/I	93.57	83.86	91.77	25.99	25.35	26.80	3.72
S/N	96.25	94.42	93.11	26.96	25.35	27.59	NS
T/F	111.31	108.35	96.94	18.72	20.90	20.41	15.67
J/P	89.66	81.89	84.23	24.95	23.89	25.86	3.36

F ratios greater than 3.12 are significant at the 5% level.

F ratios greater than 5.10 are significant at the 1% level.

Univariate Analysis

In Table 1 are shown the results of the single classification analyses of variance for three groups on the SRI variables and the MBTI variables. The contents of Table 1 are shown primarily for information purposes; hence, discussion will be limited. The data in Table 1 were not submitted to the Scheffé method since the focus of this investigation is on multivariate analysis. However, *t* tests were done (these are not tabled) comparing male secondary and female secondary groups. Results indicated that the two groups differed on six of the nine SRI variables with *all* differences in favor of the female group; i.e., their perceptions of their phenomenal worlds were more positive than were the perceptions of the males. On the MBTI variables, the *t* tests between female secondary and male secondary Ss revealed statistically significant differences on the thinking/feeling functions. The MBTI manual (Myers, 1962) provides data indicating that generally males are more "thinking" and less "feeling" than are females; our finding is therefore in accord with previous research. Comparison of the secondary male and female Ss on the MBTI introversion variable revealed that the males were more "introverted" ($t = 3.06, p < .01$).

Multivariate Analyses: SRI

TABLE 2

MALE AND FEMALE PROSPECTIVE TEACHERS
DISCRIMINANT ANALYSIS: SRI VARIABLES
CORRELATIONS WITH DISCRIMINANT FUNCTIONS

<u>Variables SRI</u>	
Self	.25
Others	.54
Children	.97
Authority	.37
Work	.16
Reality	.12
Parents	.20
Hope	.40
Total	.64

90% of trace extracted by one root: Wilks Lambda = .834.
F = 4.48, $p < .0001$

Root 1 accounted for 100 percent of the variance

$\chi^2 = 77.87, df = 10, p < .0001$

<u>Group Centroids</u>	
Male Secondary (N=70)	3.24
Female Secondary (N=300)	3.46
Female Elementary (N=65)	4.31

In Table 2 are shown the results of the discriminant analysis when the dependent variables are those yielded by the SRI. The centroids (multivariate means) of the two secondary groups are quite similar (3.24 for

male secondary and 3.46 for female secondary) but both differ from the female elementary multivariate mean (4.31). There emerged one highly significant discriminant function ($x^2 = 77.87$, $df = 10$, $p < .0001$) which accounted for 100 percent of the variance. It may be concluded that the multivariate null hypothesis is rejected *vis-a-vis* the SRI variables; i. e., the three groups may be separated on the nine SRI variables with prospective secondary school teachers—regardless of sex—differing from prospective female elementary school teachers.

The correlations between the nine SRI dependent variables and the discriminant function yield in this instance little information additional to that which is available from the univariate analyses (see Table 1). The SRI variables of *Work*, *Reality*, and *Parents* are low order predictor variables of group membership (prospective elementary versus prospective secondary school teachers) while the SRI variables—*Others*, *Total*, and especially *Children*—are seen to be powerful predictors of group classification. (The caveat of Overall and Klett, 1972, p. 92, regarding the nature of the discriminant function need not be heeded in this instance—the units of measurement of all SRI scales are identical.)

Multivariate Analyses: MBTI Variables

TABLE 3
MALE AND FEMALE PROSPECTIVE TEACHERS
DISCRIMINANT ANALYSIS - MBTI

Variables (MBTI)	Correlations With Discriminant Function #1	Correlations With Discriminant Function #2
Extroversion	.01	.05
Sensation	-.10	.46
Thinking	-.19	-.55
Judging	.00	-.59
Introversion	-.18	-.38
Intuition	.08	-.42
Feeling	.24	.59
Perception	.01	.59
E/I	.00	-.02
S/N	.10	-.46
T/F	.27	.59
J/P	.01	.60

Chi square for Roots #1 and #2 highly significant. Root #1 accounted for 95% of variance. Root #2 accounted for 5% of the variance.

Group Centroids

	Discriminant Function #1	Discriminant Function #2
Male Secondary (N=70)	2.61	-12.73
Female Secondary (N=300)	2.67	-12.71
Female Elementary (N=65)	2.67	-12.73

When the multiple discriminant statistical technique is utilized with the MBTI variables, the two female groups are found to have virtually identical group centroids on the first discriminant function (which accounts for 95 percent of the variance); however, the male group centroid is not too far removed from the females. In this analysis, a second discriminant function was extracted (accounting for 5 percent of the variance). While the three group centroids are almost identical, it is only with respect to this second discriminant function that the multivariate analysis yields information on the contribution of the *Sensing* and *Intuition* variables of the MBTI. Thus it will be noted that in the univariate analyses (see Table 1) there were *no* significant differences among the three groups on the Sensing, Intuition, or the S/N means. However, as will be seen from Table 3, the Sensing and Intuition scores do load significantly the second discriminant function. Actually, except for the Thinking and Feeling variables, none of the MBTI variables appear to contribute meaningfully to the first discriminant function. Note, however, the loading of all the MBTI variables (except *extroversion* and *introversion*) on the second discriminant function.

Conclusions

It would seem injudicious on the basis of one sample (albeit a respectably large one) to conclude definitively that the teaching level (elementary or secondary) to which prospective teachers aspire is more closely associated with a set of Rogerian-derived personality characteristics than is the sex of the prospective teacher. Yet the SRI data (Tables 1 and 2) do support such a conclusion, although cross-validation is in order. For a set of Jungian-derived personality characteristics (the MBTI variables) multiple discriminant analysis indicates that it is sex of prospective teachers rather than teaching level which the MBTI scores predict, although this statement apparently holds only for the first discriminant function but a function which accounts for 95 percent of the variance. On a second discriminant function (five percent of the variance), the multivariate means of the three groups are so close as to make interpretation difficult. In general it would seem that female prospective secondary school teachers are closer in their Jungian type profiles to female elementary school teachers than they are to male secondary school teachers.

Finally, it is believed that the findings of this investigation are concordant with those contained within a vast corpus of research writings on the relationships of teacher personality characteristics to level of teaching (see Peck and Richek, 1967, for a review of the literature).

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Role of Conceptual Tempo in Concept Formation

A sample of grade pupils were classified as impulsive or reflective on the basis of their performance on a Matching Familiar Figure Test. These two groups were then compared on a test of conservation of length and on a test of mathematics achievement. Differences were found on the conservation of length test and on the part of the mathematics achievement test which dealt with the recall of basic facts. The results for both of these variables favored the subjects classified as reflective. (Dr. Cathcart is Associate Professor in the Department of Elementary Education, The University of Alberta.)

Introduction

When young children are faced with tasks or activities for which they must choose among a number of alternative responses, some of them will find it somehow impossible to consider all of the alternatives before committing themselves. They respond quickly and often incorrectly. Other pupils appear to be more cautious and they will delay their responses until they have considered various alternatives. The latter children seem to have a longer attention span and they make fewer mistakes. These differences in conceptual tempo have been used by Kagan (1965) in his work with children. He showed them a picture (standard) and asked them to find one that is most like the standard from among six other pictures. The response time and the number of mistakes made by each child were used to identify them as either impulsive (fast) or reflective (slow).

Kagan (1963) found that differences in conceptual tempo may exist even if children are of equal intelligence and that "an individual's preferred conceptual strategy is implicated in a variety of behaviors (p. 109)." Although the capability of being reflective tends to increase with age, an

individual's conceptual strategy remains the preferred mode over a number of years.

There exists some evidence that reflective and impulsive individuals differ in their ability to learn and acquire concepts. Kagan (1963) discovered that reflective children seem to have an advantage over impulsive children when such reading skills as word recognition and word recall are considered. Cathcart and Liedtke (1969) sampled some pupils from grades 2 and 3, classified them according to conceptual tempo and administered a mathematics achievement test. The results suggested that students who achieve best in mathematics are those who are more reflective. Callahan and Passi (1971) explored the relationship between conceptual tempo and the ability to conserve length. They used subjects from kindergarten and grade one, administered two conservation items, and reported that although there was a tendency for reflective children to be better able to conserve length, the relationship did not reach statistical significance.

Piaget (1960) has provided us with detailed examples of how children reach an understanding of length. Numerous ingenious experiments illustrate the stages children pass through before they reach the stage of conservation (or the developmental stage which brings with it the realization that the length of an object does not change as the object passes through certain transformations). He concludes that

The idea of necessary conservation, which entails the complete coordination of operations of subdivision and order or change in position, is accomplished at stage III. This stage was found to have been reached by one in ten in the age range 6-7, by half of those 7-7½, and three-quarters of those 7½-8½ years old. (Piaget, 1960, p. 114).

The main purpose of this study was to select some 7½ to 8 year old subjects and to determine if there was a difference between those classified as impulsive and those classified as reflective in their ability to conserve length. Other variables investigated for possible relationships with conceptual tempo included mathematics achievement and intelligence.

Research Design

Sample

The sample consisted of 59 grade two pupils. Twenty-four of these attended a school in Edmonton, Alberta and the remaining subjects represent the grade two population of a school in the outskirts of Victoria, British Columbia.

Instruments

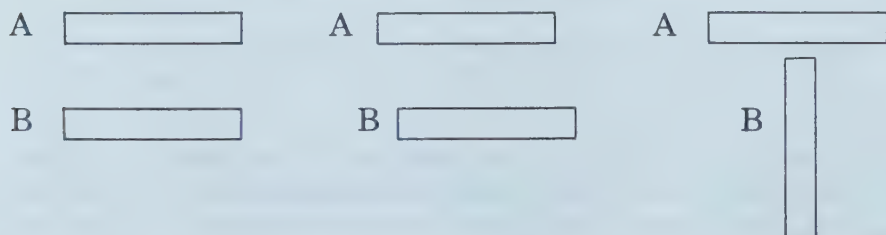
Kagan developed the "Matching Familiar Figures" (MFF) test which can be used to identify subjects as impulsive or reflective. Each item on this test consists of pictures on two 8½ x 11 inch sheets of paper. On one page a picture is presented as a standard. Another page contains six pictures similar to the standard. However, only one of the six is exactly like the standard and the subjects are asked to find that one. Two practice and six items from the MFF test were used for this study and the responses

were timed to the nearest half second and a record was kept of each response until the correct answer was given.

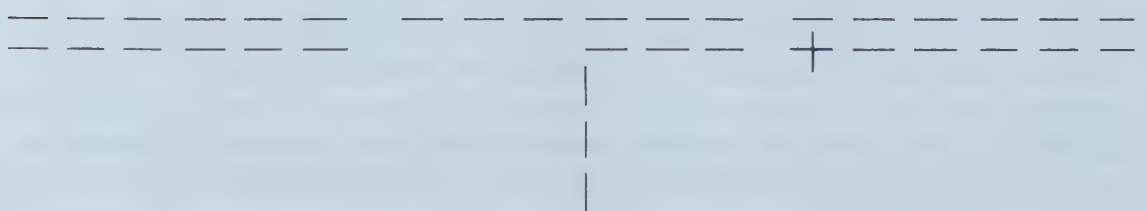
In the present study a median split was used to classify subjects as impulsive or reflective. Subjects who scored below the median time of 14 seconds and above the median number of errors of 1.4 were classified as impulsive. Children above the median in time and below the median in errors were classified as reflective. This procedure identified 20 reflective subjects, 22 impulsive and 17 subjects could not be classified as either impulsive or reflective. The mean age for the reflective subjects was 93.6 months compared to 94.6 months for the impulsive pupils.

While the median split procedure is a common method of classifying subjects as impulsive or reflective there seems to be some variation in the medians reported in different studies. For a sample of 92 second grade pupils Kagan (1965) reported a median response time of 12.1 seconds per item and a median of 1.1 errors per item. Cathcart and Liedtke (1969) found a median response time of 15.8 seconds and a median of 1.2 errors for a sample of 46 grade two and 12 grade three children. It is difficult to make a comparison with Callahan and Passi's (1971) study because they reported means rather than medians even though they used a median split to determine impulsive and reflective subjects. Furthermore their study was conducted with kindergarten and grade one subjects.

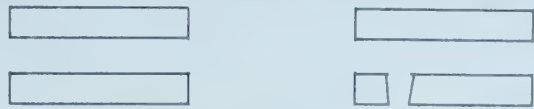
The conservation of length test consisted of ten items. Various objects and arrangements were presented. For each item the subject was faced with two arrangements and he was asked whether one was longer than the other, vice versa, or whether they were both the same length. For items one to three a stick (10 inches) and a string (15 inches) were used. In item one the endpoints were coterminous, for item two the string was extended, and finally in third item the string was reduced to its original position. The second of these arrangements was not marked. For items four to six two four-inch Cuisenaire rods were used. The following transformations were presented in the sequence shown. After the subjects had agreed that A and B were the same length, the following questions were asked each



time. "Tell me _____ (name of subject), is this one longer (pointing to A), is this one longer (B), or are they the same length?" A similar procedure was used for items seven to nine where the subjects faced twelve toothpicks and the following sequence of transformations:



For the last arrangement, one toothpick was broken. Two paper strips (10" x 1/2") and a similar procedure were used for questions ten and eleven.



For the last question, one of the strips was cut.

A mathematics achievement test consisting of 31 items was developed. Fifteen of these items were in multiple choice form and they were designed to measure understanding of mathematical concepts and their application. There were six verbal problems and ten questions on basic facts. Many of the items were taken directly from the textbook the pupils were using as part of their mathematics program (Hartung, 1965).

The mathematics achievement test yielded four scores. The first 15 multiple choice items composed the first subtest which was called "Concepts." The six verbal problems yielded a measure of problem solving ability. (Only the correct answer was scored). The 10 questions on basic facts enabled the calculation of a score on "Basic Facts." The total score was the sum of the scores on the above subtests.

The Kuder-Richardson reliability for the total test was 0.632. Reliability coefficients for the subtests were as follows: Concepts, 0.589; Problem Solving, 0.726; Basic Facts, 0.645.

To obtain a measure of intelligence the Otis Quick-Scoring Mental Ability Test (Alpha) was used. This test consists entirely of pictures and designs. Since it includes a verbal and non-verbal part, three scores were obtained. Reliability coefficients reported in the manual (based on 495 cases) of the non-verbal and verbal tests are .68 and .71 respectively. The reliability for the whole test is .81.

Results

When the subjects were subdivided by both sex and conceptual tempo the distribution in Table 1 resulted.

TABLE 1
RELATIONSHIP BETWEEN SEX AND CONCEPTUAL TEMPO

	Reflective	Impulsive
Male	8	16
Female	12	6
$\chi^2 = 4.582$		$p = .032$

The above distribution indicates that for the subjects in this sample, more girls tended to be reflective and more boys impulsive. Perhaps girls are more mature at this age level and if reflectiveness is a factor of maturity as Kagan (1963) seems to imply, then this result is as one would expect.

Three intelligence scores (verbal, non-verbal and total IQ) were obtained from the Otis Quick-Scoring Mental Ability Test (Alpha). A t-test was used to compare the reflective and impulsive students on these three measures. The results are summarized in Table 2.

TABLE 2
COMPARISON OF REFLECTIVE AND IMPULSIVE SUBJECTS ON INTELLIGENCE

IQ Measure	Means		St. Deviations		DF	t	p
	Reflective	Impulsive	Reflective	Impulsive			
Verbal	102.85	97.45	11.64	11.37	40	1.519	.137
Non-verbal	114.00	104.18	13.15	11.73	40	2.557	.014
Total	108.70	100.09	13.12	12.64	40	2.165	.036

These results show that reflective children in the sample obtained higher scores on the intelligence test than the impulsive subjects. Perhaps the characteristic of being able to weigh various alternatives before replying to a task and not responding quickly without such consideration is responsible for these differences in intelligence results.

The higher IQ score of reflective subjects coupled with the finding that more girls tended to be reflective than boys suggests the possibility of an interaction effect. The interaction between sex and conceptual tempo on each of the three IQ measures was tested using a method outlined by Winer (1962). There was no significant interaction on any of the IQ measures, the lowest probability being greater than 0.6.

Conceptual Tempo and Mathematics Achievement

One of the major purposes of the present study was to determine if a difference existed between impulsive and reflective pupils in their achievement in mathematics. To test the foregoing problem sex was used as a blocking variable since it was found to be significantly related to conceptual tempo and IQ was used as a covariate since reflective and impulsive subjects differed significantly in their mean IQ score. The two-way analysis of covariance procedure outlined by Cooley and Lohnes (1962) was followed. In order to obtain proportionality between cells across rows and columns six of the 16 impulsive males and eight of the 12 reflective females were randomly selected to represent their respective cells. (Refer to Table 1).

The adjusted means, F ratio with 1 and 23 degrees of freedom and the probability of the F ratio for each of the four scores obtained from the mathematics achievement test are presented in Table 3.

The interaction between sex and conceptual tempo was investigated for each of the criterion measures but none of the interaction effects approached significance. The lowest probability associated with interaction was 0.15 on the total test score.

When the subjects of the mathematics achievement test were considered, the adjusted means for the reflective subjects were higher than

TABLE 3
ANALYSIS OF COVARIANCE BETWEEN GROUPS ON
MATHEMATICS ACHIEVEMENT (COVARIATE = IQ)

Group	Mathematics Achievement Test			
	Concepts	Problem Solving	Basic Facts	Total
Reflective	7.32*	1.48*	7.96*	16.75*
Impulsive	7.75*	1.03*	6.06*	14.83*
F _(1,23)	.28	.65	6.20	1.70
Probability	.39	.43	.02	.20

*Adjusted means

the adjusted means for the impulsive subjects on the parts of the test which dealt with problem solving and the recall of basic facts. Only the latter difference in means was statistically significant. On the subtest dealing with concepts, the adjusted mean for the impulsive subjects was higher than the adjusted mean for the reflective subjects. However, this difference in means was not significant.

Conceptual Tempo and Conservation of Length

The usual Piagetian test item involves a degree of uncertainty for the subject, especially for non-conservers or for subjects in a transitional stage between non-conservation and conservation. It was hypothesized, therefore, that a relationship exists between conceptual tempo and conservation. On a test of conservation of length the mean for reflective subjects would be different from the mean for subjects classified as impulsive. The corresponding null hypothesis was tested with a two-way analysis of covariance where sex formed the second blocking variable and IQ was the covariate. This analysis was carried out in conjunction with the analysis of the mathematics achievement test. Table 4 contains a summary of the

TABLE 4
ANALYSIS OF COVARIANCE BETWEEN GROUPS ON
CONSERVATION OF LENGTH (COVARIATE = IQ)

Source	SS	DF	MS	F	P
Conceptual Tempo	29.99	1	29.99	4.46	.04
Sex	9.95	1	9.95	1.48	.23
Tempo X Sex	0.02	1	0.02	0.003	.09
Within	154.59	23	6.72		
Total	194.55	26			

analysis. The adjusted means were 7.61 and 5.51 for the reflective and impulsive subjects respectively.

For the sample in this study the mean for the reflective subjects was significantly higher than the mean for the impulsive subjects. This could imply that reflective children conserve length before impulsive children do.

Summary and Discussion

The major purpose of the study was to examine the relationship of conceptual tempo to mathematics achievement and to the acquisition of conservation of length. With respect to achievement in mathematics, the reflective subjects outperformed the impulsive children only in their ability to recall basic facts. One's first reaction is that this is an area where differences should be least pronounced since memorization of facts should be as easy or as well established for the impulsive child as it is for the reflective one. However, in the testing situation various approaches for arriving at and recording the answer to unfamiliar questions were observed. Before recording their answer some children used various aids such as their fingers or a large number line at the front of the classroom. Others seemed to simply write down the first answer which came to mind without giving it a second thought. Perhaps the children who used aids were the reflective children. They took the time to work out the problem from their knowledge of the numeration system, whereas others simply guessed at the answer or even omitted the questions involving facts which were unfamiliar to them. This difference in conceptual tempo or cognitive strategy could have accounted for the difference in performance. If this conjecture is true important implications for evaluating pupils in an elementary mathematics class arise. To evaluate impulsive pupils fairly they could be faced with a situation where they must either know the facts or where they must use an aid of some kind to arrive at an answer. Observing them in a setting where more than the recording of an answer is required, such as in a game situation may be one useful approach.

It seems that for the sample used in this study, reflective children conserve length before the impulsive children. Piaget (1960), rather vividly, demonstrated the fact that the formation of a concept is a slow, developmental process. Conceptual thought gradually appears and develops during the pre-operational period. However, basic concepts are organized into coherent systems once the child has reached the concrete operational stage. One of the most important components of the transition from pre-operational to concrete operational thought is the acquisition of various conservations. If the results of this study are true for the conservation of other properties this would have important implications for those who teach in the primary grades.

The tendency for reflective subjects to be superior to impulsive children in conservation of length was also observed by Callahan and Passi (1971).

If reflective children score higher on intelligence tests than impulsive pupils because they take more time to weigh alternatives before they respond then there exists another reason for questioning the validity of an intelligence test. The question "what does it measure?" seems to have added meaning when considered in the light of the results reported here.

Since sex was used as a blocking variable in this study it was possible to look at sex differences on conservation of length and on each of the four mathematics achievement scores. No significant differences were found. However, sex was significantly related to conceptual tempo. This was explained in terms of maturational differences.

Each teacher is aware of individual differences which exist in the classroom. Differences among pupils are usually explained on the basis of such factors as mental age, motivation, personality, and/or socio-economic status. More attention could be paid to conceptual tempo as a factor contributing to individual differences. The little boy at the back of the room who seems slow in responding to a task may be just as "intelligent" as his classmates. His hesitation may be due to his reflectivity. On the other hand, impulsive child may report only the first answer which comes to mind. If this response is incorrect only further examination will tell whether the child did or did not know the correct answer.

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Part-Time Teachers of Adults

There is ample evidence that a substantial number of elementary or secondary school trained teachers are teaching adults on a part-time basis. It was with a view to learning more about this particular group of teachers that this study was undertaken. The study was interested in finding out why these teachers came into adult education, why they remained teaching in this field, and whether the teachers perceived particular problems within their capacity as teachers of adults, as compared with teaching children and youth.

Findings indicate that these part-time teachers of adults know very little about the resources and literature of adult education, but that they enjoy the stimulation which comes from exposure to highly motivated adults. In their opinion, teaching adults has had an impact on their effectiveness as daytime teachers in the elementary and secondary school systems. The study provides data of immediate practical value to those responsible for both the initial training and the continuing education of teachers. (Dr. Draper is Associate Professor in the Department of Adult Education, Ontario Institute for Studies in Education).

Statement of the Problem

An examination of numerous school employment records indicates that upwards of 12% of the total elementary and secondary school teacher population become involved at some time in their career with the part-time teaching of adults. When one transfers this into actual numbers, the size of this group is considerable.

In spite of the large number of teachers who are working with adults on a part-time basis, surprisingly little is known about them with respect to their attitudes and reasons why they are working with this older age group, many of them eventually coming into adult education on a full-time basis.

Two further trends occurring in Canadian society seem to have direct

bearing on adult education. One is the increase in the educational opportunities becoming available for the young and older adult populations. This trend has obvious implications for the greater number of teachers of adults which will be required. Many of these will continue to be teachers who have been trained as elementary or secondary school teachers. The trend here is toward teachers working with a greater variety of age groups throughout their professional career.

A second trend involves a re-thinking and re-definition of the role of the teacher as a facilitator and resource person for assisting others with their learning. New skills and attitudes are required to perform these new roles successfully. One attitude is accepting that learning is a continuous process. If the elementary and secondary school teacher is to develop this attitude in the minds of children and youth, then it seems that he must understand and practice the concept himself. One way to achieve such understanding is to be involved in helping adults in achieving their own continuing education.

This is essentially an exploratory study which centers on developing a profile of part-time teachers of adults. In addition, the following questions were investigated:

1. Why do elementary and secondary school teachers engage in the part-time teaching of adults?
2. What are the backgrounds of these teachers?
3. What problems, if any, particularly of a unique nature, do they encounter in teaching adults?
4. What expressed needs, if any, do they have in increasing their competence in working with adults?
5. Assuming that training needs are expressed, what kinds of assistance would the teachers like to have and from whom would these teachers seek assistance?

It was thought that if there was evidence that part-time teachers of adults perceived any teaching problem areas peculiar to them, then appropriate guidelines could be developed regarding the pre-service and in-service preparation of teachers. The purpose of the study was to provide information which would be of interest to, and of practical value for, school boards, departments of adult education of universities, and teacher training colleges.

Selected review of literature

Trends in Teaching

A paper by Wayson (1964, p. 4) states that "The new teacher will work as often with adults as with children." Similar conclusions are drawn by Clarke and Coutts (1971, pp. 48, 54) for instance, the following trend is stated:

Candidates for teacher education, both for admission to preparatory programs and for first certification, will be required to exhibit a satisfactory standard of excellence in human relations; ability to relate to young people and to work with others, both young and old.

Forty-five per cent of the respondents to the above statement felt that this trend would be implemented between 1971-75 and forty-eight per cent felt

that it would be implemented between 1975 and 1985. In reaction to the statement:

Whereas now nearly all teachers are prepared for teaching at the Grades 1-12 (or 13) level, up to half will be prepared for teaching at earlier or later levels such as nursery, kindergarten, adult and continuing education.

Forty-five per cent felt that this trend would be under implementation sometime between 1975 and 1985.

Another study on trends in teacher education by Channon (1971, p. 9) indicated that for a number of institutions surveyed in the study, "... the major recent change in program was increased selection of options".

These three studies seem to indicate, among other things, that an increasing number of teachers will be working with older age groups. Secondly, that greater choice of options within the programmes of studies in teacher training institutions could conceivably make it possible for candidates to select adult education as an option, possibly accompanied by a related internship programme.

Studies of part-time teachers of adults

The purpose of a study by Messerschmidt (1967) was to determine the practices used by community colleges in the State of Michigan to recruit, hire, and prepare part-time instructors in vocational technical education. Topics which instructors wanted in in-service education included teaching methods, examination item writing, lesson plan preparation, and the philosophy of the community college.

In the face of arguments put forward for the financing of adult education in London (England) as a self-supporting service, Bryan (1969, pp. 285-90) writes that the need to educate and train part-time teachers has become more urgent than ever.

A study (McLarney, 1967) involving eleven junior colleges in the greater Los Angeles district concluded that in-service programmes should bring daytime practitioners and evening (part-time) faculty together for unstructured discussion sessions to strengthen academic and professional ties.

In a study on the Application Blank as a predictive Instrument for the Selection of Part-time Teachers in an Evening College, Heilig (1963) concluded that characteristics related to teaching success for the staff as a whole were, among others, teaching experience, graduate degree status, and professional group affiliations.

Styler (1968), in a publication entitled "Further Education: Part-time Teachers Speak," summarized reports of forty-four experienced part-time teachers in Yorkshire. His discussions include, among other things, the special problems relating to subject areas, teaching aims, difficulties, effective teaching, lessons learned by teachers, and the teachers' awareness of the needs of the students.

A highly relevant study relating to the topic of part-time teachers of adults was conducted by Shorey (1969). Although his study emphasized the elementary and secondary school teachers' participation in continuing education activities, he did ask those teachers who have been involved

during the past five years (or are now involved as an administrator, instructor, counsellor, etc., in any adult education program) to indicate the extent, if any, to which such participation has contributed to their personal and professional growth. One hundred forty-two out of nine hundred eleven respondents or 15.5% reported that they had been or are presently involved in teaching adults on a part-time basis. Such respondents were likely to be male, to be between the ages of 30 years and 49 years, to hold a degree, to have more than five years teaching experience and to be employed in a secondary school. Shorey goes on to add that:

The study found that day-school teachers attached considerable importance to working in a professional capacity with adults. It may well be that this activity provides a new and different challenge to the teacher and an opportunity to develop and explore challenging teacher-student relationships. If this hypothesis were substantiated by subsequent research, it might have several implications both for teacher training and for teacher work programs.

A longitudinal study (Draper and Ellis), to cover at least a five year period, is presently underway in the Province of Ontario. The study follows, over this five year period of time, the teaching and continuing education activities of teachers, from the time they graduate from French language teaching training colleges in Ontario. The study will examine the extent and patterns of involvement of these teachers in teaching adults.

This brief survey of the literature seems to encourage exploratory research on part-time teachers of adults.

Population and methodology

Data for the study were collected from the North York and Etobicoke school boards of metropolitan Toronto. Questionnaires were distributed to all of the part-time teachers of adults, employed by these two school boards, who were employed full-time either as elementary or secondary teachers. The analysis of data in this study was based on 294 questionnaires.

Presentation of data

Categories in the questionnaires were coded and the responses transferred to punch cards for computer analysis. Initial treatment of the data consisted of one-way tabulations and descriptive statistics. Much of the data were expressed descriptively in frequencies or in percentages.

Many of the questions required the respondents to rank alternative responses. Examples of such questions are where respondents are asked to indicate on a scale the importance their participation in teaching adults had for them. Another type of question asked respondents to indicate on a scale the degree to which a particular issue was perceived to be a problem. These data were treated by use of the Optimal Rating Scale (Bock, 1960).

Three hundred and sixty-nine contingency tables were constructed and analyses were carried out to discover whether or not key variables such as sex, age, school board, education, kinds of courses taught, years of experience and salary level were related to reasons given for teaching adults, perceived problems and expressed training needs. Significant differences were found in forty-four cases.

Analysis of data was organized under the following headings:

1. Personal information about the respondents, i.e. marital status and number of dependent children, sex, age.
2. Educational background of the respondents.
3. Occupational background of the respondents.
4. Salary ranges of respondents.
5. Information relating to the respondents' length of service and subjects taught.
6. Sources from which respondents have learned most about teaching adults.
7. Reasons stated by the respondents for wanting to enrol in a programme for teachers of adults.
8. Influence of teaching adults on personal participation in continuing education.
9. Influence on other teaching situations, from teaching adults part-time.
10. Nature of the teachers' entry into the part-time teaching of adults.
11. Reasons why adults enrol as students, as perceived by teachers taking part in the study.
12. Current problems in adult classes.
13. Perceived teacher training needs.

Summary of findings

In this article, the following summary of findings is limited to descriptive data.

Of the total number of respondents taking part in the study, 81.3% were male and 18.7% were female. The percentage of male part-time teachers of adults is considerably higher than the approximately 66% of males who are teaching in the secondary school system in Ontario. Likewise, the percentage of female respondents is considerably less.

Only 6.5% of the total responses indicated that the training received at teachers' colleges was a major assistance to the part-time teacher of adults. However, several respondents did indicate that their teachers' college provided an optional opportunity to observe and practice teaching with adults. Seventy per cent of the teachers thought that a seminar, or course in adult education, should be an optional part of the curriculum in a teacher training college.

Respondents were asked to state the reasons they would consider enrolling in a programme of studies for teachers of adults. The most important of these was stated to be "to increase competency as a teacher of adults" (36%). Twenty-six per cent stated that they wanted an opportunity to exchange ideas with other teachers of adults. The respondents stated that, in descending order, the adult education areas they would like to learn more about were: adult learning and motivation; teaching techniques and methods; instructional materials and audio-visual aids; the counselling of adults; and administration of adult programs.

Twenty-two per cent of the teachers indicated that they had considered transferring to full-time teaching of adults, 5% replied "no" and 17% said they "didn't know". Many who responded affirmatively to this question,

indicated that they were particularly interested in exploring opportunities in the Colleges of Applied Arts and Technology (community colleges).

In designing the questions for the study, it was believed that reasons for teaching adults might shift as the teachers gained more experienced in the field. However, a similar response pattern is found to the questions why they initially came into adult education and why they were remaining in it. Respondents indicated that "an interest in working with a different age group" was their most important reason initially. Thus, the economic motive was not the primary reason for teaching adults. Other reasons given for entering this field were "a desire to try something new" and "an opportunity for personal growth".

Many teachers stated that peers and administrators had little or no impact on their decision to teach adults. In this group of part-time teachers a smaller number of teachers of credit courses than one would expect by chance looked upon personal growth as an important motivation, whereas more non-credit teachers considered personal growth to be an important reason for coming into adult education on a part-time basis.

Generally speaking, teachers regard night school teaching as a marginal extension of their primary function. However marginal these activities may actually be, 65% of the teachers reported that teaching adults has had some impact on their effectiveness as elementary or secondary school teachers. In the opinion of many, this experience has enabled them to present the real world more accurately to their day students and permitted them, as they work with highly motivated adults, to understand better the concept of learning as a life-long process.

Forty-one per cent of the respondents indicated that teaching adults influenced their own participation in continuing education. According to this group, it has broadened their horizons and provided a stimulus to experiment with new methods and procedures. It has suggested to many the importance of students being voluntary participants in the learning process. They have observed the impact of the attitudes of highly motivated adults, with clear objectives, on their learning achievement.

Teachers in the study indicated that they had learned most of what they now know about teaching adults from "on the job experience" and "informal discussions with colleagues". According to the responses, the amount they learned through their own school board, or from professional adult education associations, was insignificant. Interestingly, up to the present, teachers seem to have developed an internal communication network whereby they are able to discuss some of their activities relating to teaching adults. For one reason or another the teachers have apparently not tapped the resources of their own school board, nor have they tapped the resources of professional associations or academic departments within university settings. Furthermore, 98% of the respondents said that they did not belong to an adult education association; almost the same percentage indicated they did not subscribe to any adult education journals.

Teachers were asked to list in descending order the most important problems they faced. These were: working with students with widely differing levels of intellectual achievement, helping the slow learner, assessing learning problems of students and fitting the instruction to the

background of the adult students. It is the opinion of these teachers that many of their problems originate in the heterogenous make-up of most adult classes in terms of variety of experience, age, capacity, qualifications, and attitudes found among the students. Several night school teachers elaborated on the time shortage, stating that they frequently lacked sufficient time and energy to prepare adequately for night school classes.

Finally, teaching of adults was perceived by teachers as making an important contribution both to their professional and personal development. With respect to professional development, respondents who had engaged in teaching adults perceived this activity as making an important contribution to the development of their skills and competencies as teachers.

Discussion

There is ample evidence to suggest that the personal and professional growth of teachers is perceived by them to be enhanced by working with adults. It may not be so much the act itself that makes it worthwhile, but the fact that he is doing something different within the scope of his profession. This suggests that the systematic placement of teachers with different age levels of students throughout the teacher's professional career, be considered by school boards. Furthermore, if one assumes the desirability of children and youth interacting with adults, then more adult programmes could be scheduled during the daytime during school hours. The presence of adults in the school would help to impress upon youth the importance of continuing education. Conversely, it might be considered feasible to reschedule some high school classes to meet in the evenings.

This study seems to have important implications also in relation to the pre-service training of teachers. It is known that a substantial percentage of teachers trained for the elementary and secondary school systems enter some aspect of adult education. Is it not possible for teacher training colleges to incorporate greater opportunities for the teacher-in-training to learn more about working with various age groups, particularly the out-of-school population? This would be in keeping with the trend to develop more fully the skills of the teacher in his role as a facilitator of learning.

Colleges might be encouraged to offer greater opportunities to trainees to conduct their practicums with adult groups. The fundamental concepts of learning, and of working with and helping others, are presumably transferable, regardless of age group.

The study seems to have implications also for in-service training. Teachers involved in adult programmes could be encouraged by school boards to participate in special in-service training programmes where teachers would have opportunities of sharing insights and experience with one another, and of tapping the expertise of the professional adult educator.

The argument that teaching and learning are different as between adults and other age groups, even if true, should not be exaggerated. What seems more relevant is whether teaching older students does actually enhance the professional competence of the teacher and whether it satisfies certain personal developmental needs of the teachers.

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Environmental Variables Relevant to the Development of Cognitive Abilities

Data concerning several environmental variables considered likely to relate to cognitive development among Canadian boys aged 12 to 14 were factor analyzed and the resulting structures compared for three levels of socioeconomic status. Two techniques for comparing factor patterns derived from different samples were applied so that the degree of congruence of factors generated by the same variables in the different groups might be assessed. A generally high degree of factorial congruence across socioeconomic levels was noted, and the implications of this finding briefly discussed. (Dr. Bowd is Assistant Professor in the Department of Educational Psychology, Faculty of Education, University of Manitoba).

In 1964 Bloom pointed out that the "dearth of direct measures of the environment . . . restricts our fuller understanding of the development of particular human characteristics" (1964, p. 10). If particular human characteristics are to be measured and related to "the environment", then valid and reliable measures of environmental variables are necessary. Specific components of the environment considered likely to have direct implications for particular aspects of human cognitive growth and development need to be described and measured. In the past psychologists and sociologists have tended to use quite molar categories when attempting to classify environmental data, and have often assumed that their categories remained equally valid across different groups.

Discussing the inadequacy of then current research methods for dealing with these questions, Bloom (1964) goes on to define environment as:

the conditions, forces, and external stimuli which impinge upon the individual. These may be physical, social, as well as intellectual forces and conditions. We conceive of a range of environments from the most immediate social interaction to the more remote cultural and institutional forces (p. 187).

In Bloom's view the most fruitful level on which to examine the role of the environment lies between specific interactions or experiences and the total environment. He prefers to "conceive of the environment in terms of

the probability that it provides for selected experiences or interactions" (p. 187). This implies that for any given human characteristic there exist critical environmental variables, and that the development of that characteristic is a direct function of the probability of stimulation related to those variables.

Bloom describes these variables in a very general sense:

... the behavior of significant individuals in the environment, the presence and use of specific rewards and punishments, the presence and clarity of models of behavior, and the availability and use of particular facilities and materials (p. 221).

Utilizing Bloom's guidelines, Wolf (1964) reduced the problem of assessment to the identification and measurement of those aspects of the total environment likely to relate to the development of selected specific behavioral characteristics. The initial selection of relevant environmental variables is dependent then upon the choice of a specific human characteristic to which they might logically be hypothesized to relate.

Previous studies which have been concerned primarily with the identification of common abilities across diverse socioeconomic and cultural groups have very often assumed the environmental variables they have assessed to be equally distinctive and salient across groups (e.g. Lesser, Fifer and Clark, 1965; MacArthur, 1968, 1969; Irvine, 1969; Vernon, 1969). However, as Evans (1970) has implied, this may not in fact be the case. It may be that patterns of intercorrelations for environmental variables in differing socioeconomic or cultural groups may generate quite different structures following factor analysis. Alternatively, there may be certain environmental variables which may be analyzed in terms of factors which are congruent across groups. The existence of such factors would depend upon similar patterns of correlations among the several environmental indices for each of the social groups included in the comparison.

When environmental assessment is carried out by self-report techniques it is important that items remain constant for different groups of subjects if factorial comparisons are to follow. Should consistent factor variables emerge, factor scores for such variables might be compared across groups by the usual methods.

Problem

The broad objective of this study then, is to attempt to discover whether a set of environmental variables presumably of significance for cognitive growth, generates similar factor structures across groups of varying socioeconomic status.

In the past it has been assumed that different factorial structures arising after the analysis of intelligence and ability test batteries in diverse groups represent different kinds of "intelligence". Such differences in ability patterns have been supposed to arise from environmental conditioning, however at the same time it has been assumed that the relevant environmental indices have been related to one another in the same way for different populations. By selecting a molar category such as SES and examining the relationships between several environmental variables at different socioeconomic levels the latter assumption might be scrutinized more closely.

Method

Subjects

A total group of 233 boys aged from 12 to 14 was selected for the study. The subjects were selected in an attempt to provide a sample which represented the range of socioeconomic status typical of the Canadian population as a whole. Three Winnipeg schools drawing from diverse backgrounds provided the subjects, who were then classified according to paternal occupation using the Blishen Scale of social standing in Canada (Blishen, 1958).

The overall mean of the group was 52.40, with a standard deviation of 8.62, compared with the Blishen Scale's mean of 50 and standard deviation of 10. The median social standing of the selected sample was 50.10. The total sample was then divided into three groups. All those having a score of 56 or better were classified Upper SES, those scoring from 49 to 55 Middle SES, and those scoring from 37 to 48 Lower SES. These limits were chosen to provide three roughly equal groups showing approximate correspondence with Blishen Scale categories. The Upper group included 75 boys primarily from classes 1 and 2 of the scale. There were 70 subjects in the Middle group which accounted for most of class 3 and class 4. The Lower group was drawn mainly from classes 5, 6 and 7, and included 88 individuals.

Instruments

All subjects were administered three ability tests: Raven's Progressive Matrices (Raven, 1938), an open-ended Paper Formboard and the Mill Hill Vocabulary Scale, junior set A. Thus three abilities basic to educational achievement were assessed—general intelligence, spatial ability and verbal ability.

A questionnaire was constructed in order to obtain information concerning the aspects of the child's home environment considered likely to influence his cognitive development. This information was elicited directly from the boys themselves, and consequently must strictly be regarded as representing the child's perception of his environment.

A previous study (Bowd, 1972) indicated that environmental correlates of mechanical aptitude in diverse cultural groups may be described in terms of two basic factors, "background" and "activities", which showed considerable congruence across groups. The present questionnaire was developed in an attempt to examine whether similar factors might describe a sample of environmental items across different social classes.

An initial pool of 32 items was assembled, covering the following nine general aspects of the home environment: socioeconomic level of the family; exposure to relevant household objects and reading material; association with adult figures particularly skilled in relevant ability areas; leisure time activities and hobbies; vocational aspirations; perceived parental aspirations for the child; language background; nature of discipline in the home; mother/father dominance in the home.

Principal components analysis followed by varimax rotation was performed on these items for the total pooled data, and those variables loading

on specific factors and showing little relationship with other variables in the analysis were excluded from further examination. The item pool was reduced to those ten variables considered most significant in terms of their patterns of correlations with each other and with the ability test variables.

Scores were next analyzed after being separated for each of the three socioeconomic classes.

Method for factorial comparison

The environmental data for each social class group was analyzed separately by the principal components method followed by varimax rotation. In each case the ten background variables were accounted for in terms of four factors, each accounting for at least 10% of the total variation in the sample.

Two procedures were then applied in an attempt to determine the degree of congruence across different social classes of the factors so derived. The first approach involves the designation of one matrix as a standard or "target", the other matrices being rotated to maximal congruence with it (Evans, 1971). In the present case the Middle SES matrix was designated target following varimax rotation. The orthogonally transformed matrices of the remaining groups were then transformed to maximal congruence with the designated target.

The comparison of factor matrices still involves some degree of subjectivity. Most commonly visual inspection is employed, however in the present study comparison is aided by the use of Root Mean Square (RMS) Discrepancies. This index of similarity is calculated for each factor—it is the square root of the mean of the squared differences between corresponding coefficients in the two matrices. Comparison is further aided by the use of congruence coefficients (Harman, 1964).

A second method of producing maximum similarity between factor matrices does not employ a target matrix, but rather involves the mutual transformation of factors from each of the several matrices (Evans, 1971). The resulting matrices are such that all of the corresponding first factors are most similar, then the corresponding second factors, and so on. Additionally, the average of the transformed matrices is computed, it then being possible to compare the transformed matrices with the average matrix by use of the congruence coefficients and RMS discrepancies. Once the number of congruent factors has been determined, a final orthogonal transformation may be applied.

Results

The technique employed for assessing significant environmental variables in this study is that most commonly encountered in the literature—namely, self-report questionnaire regarding the presence or absence of objects, people and activities that the investigator considers likely to relate to the individual's development. In the past this method has tended *not* to yield large or impressive relationships between behavioral and situational variables, a finding which is also confirmed in the present study. Correlations between selected environmental variables and test scores were uni-

formly low, achieving significance in several cases because of the relatively large sample sizes employed. These data are presented in Table 1. However, the principal interest of this investigation is in the pattern of correlations between environmental variables themselves.

TABLE 1
CORRELATIONS BETWEEN SELECTED BACKGROUND
VARIABLES AND TEST SCORES

Background variable	Ability test		
	Matrices	Formboard	Vocabulary
Hobbies	22	08	90
Mechanical activities	12	06	23
Cultural activities	13	16	16
Books owned	03	09	12
Magazines	-06	-05	-04
Reference Books	14	13	19
Magazine subscriptions	-03	05	-03
Word Game	09	10	17
Chess or checkers	11	-03	22
Bicycle owned	13	02	06

Decimal points omitted

For $p = .05$, $r = 0.14$

For $p = .01$, $r = 0.17$

The total set of questionnaire items was analyzed by the principal components method and varimax rotated, and variables loading primarily on specific factors excluded from further analysis. The retained variables appear to depend mainly upon the actual activities performed by the child and the presence in his home environment of books and magazines.

TABLE 2
VARIMAX FACTOR MATRIX: UPPER SES

Variable	Factor			
	I	II	III	IV
Hobbies	07	<u>77</u>	-03	17
Mechanical activities	05	09	<u>85</u>	11
Cultural activities	06	03	<u>89</u>	02
Books owned	23	<u>65</u>	11	-26
Magazines	27	04	33	<u>72</u>
Reference books	<u>61</u>	05	<u>18</u>	<u>21</u>
Magazine subscriptions	03	-03	-05	<u>90</u>
Word game	<u>73</u>	-02	-07	<u>22</u>
Chess or checkers	<u>85</u>	02	07	-17
Bicycle owned	-15	<u>60</u>	06	00
Cumulative percent of variability	24%	38%	53%	64%

Decimal points omitted

TABLE 3
VARIMAX FACTOR MATRIX: MIDDLE SES

Variable	Factor			
	I	II	III	IV
Hobbies	-09	13	-34	-77
Mechanical activities	77	18	-05	-10
Cultural activities	42	05	14	-76
Books owned	56	29	05	-16
Magazines	22	66	08	-24
Reference books	81	-14	-24	03
Magazine subscriptions	02	85	05	05
Word game	05	53	-44	-03
Chess or checkers	40	13	-73	12
Bicycle owned	-05	-18	-73	-28
Cumulative percent of variability	26%	41%	53%	64%

Decimal points omitted

TABLE 4
VARIMAX FACTOR MATRIX: LOWER SES

Variable	Factor			
	I	II	III	IV
Hobbies	17	16	-17	74
Mechanical activities	-08	83	-07	15
Cultural activities	09	73	43	-01
Books owned	14	15	54	-01
Magazines	80	-04	24	-08
Reference books	20	16	60	28
Magazine subscriptions	80	02	08	34
Word game	03	-08	69	00
Chess or checkers	-30	-25	40	57
Bicycle owned	17	16	39	52
Cumulative percent of variability	25%	38%	49%	60%

Decimal points omitted

The independent varimax factor matrices for each of the samples are dissimilar in a number of respects. As Tables 2, 3, and 4 illustrate, factor loadings tend to be very mixed across groups, making visual comparison almost impossible. In each group separate factors loading on reading material available and on cultural and mechanical activities performed are evident. The loadings on the remaining factors are quite mixed and interpretation is not considered possible.

In order to determine the similarity of the factor patterns emerging

for each group, the varimax matrix for the Middle SES sample was designated as "target" or standard, and the two remaining matrices rotated to maximum congruence with it according to the procedures described by Evans (1971). RMS discrepancies and congruence coefficients were computed for each factor in both groups (Table 5).

TABLE 5
FACTORIAL CONGRUENCE WITH TARGET MATRIX

Group	Congruence coefficients			
	Factor			
	I	II	III	IV
Upper	85	83	73	71
Lower	79	76	92	63

Group	Root Mean Square Discrepancies			
	Factor			
	I	II	III	IV
Upper	24	24	28	28
Lower	28	28	15	31

Decimal points omitted

The degree of correspondence between the varimax factor patterns for the Upper and Lower SES groups when compared with the Middle SES group was generally moderately high. The first three factors showed reasonable congruence, however the fourth factor cannot be considered equivalent across groups.

The second method for comparing factor structures arising in different groups was then utilized. The varimax matrices for each social class sample were rotated by orthogonal transformations so that successive factors are maximally congruent. The resulting matrices are such that all the corresponding first factors are most similar, then the corresponding second factors and so on. Thus no single factor matrix is considered as a possible standard, and the procedure becomes rather more useful when factor interpretation after an initial analysis is problematic.

For comparative purposes the average matrix of the individually transformed matrices has been computed (Table 6), and both Congruence Coefficients and RMS Discrepancies calculated. As Table 7 shows, there is a high degree of congruence across all groups for all four factors.

The average of the matrices generated by maximizing congruence for successive factors has resulted in four congruent factors which are open to more ready interpretation than those arrived at by the procrustean approach.

The first factor, loading highly on both cultural and mechanical activities, appears to be defined by the actual operations the child performs

TABLE 6
AVERAGE MATRIX: VARIMAX ROTATED

Variable	Factor			
	I	II	III	IV
Hobbies	12	14	-01	.78
Mechanical activities	<u>.75</u>	04	08	<u>.05</u>
Cultural activities	<u>.83</u>	09	02	09
Books owned	<u>.34</u>	08	<u>.33</u>	14
Magazines	22	<u>.75</u>	<u>.12</u>	00
Reference books	<u>.36</u>	10	<u>.58</u>	03
Magazine subscriptions	-03	<u>.84</u>	<u>.05</u>	10
Word game	-01	29	<u>.59</u>	02
Chess or checkers	-01	-11	<u>.76</u>	21
Bicycle owned	05	-04	25	<u>.52</u>
Factor content	Activ- ities	Maga- zines	Verbal Background	Practical Background

Decimal points omitted

TABLE 7
FACTORIAL CONGRUENCE WITH AVERAGE MATRIX

Group	Root Mean Square Discrepancies			
	Factor			
	I	II	III	IV
Upper	10	13	14	18
Middle	14	16	16	16
Lower	11	14	14	17
Group	Congruence Coefficients			
	Factor			
	I	II	III	IV
Upper	97	95	95	87
Middle	95	92	92	88
Lower	96	94	94	88

Decimal points omitted

upon his environment and has been termed “Activities”. Factor II is characterized by the two single high loadings for magazines reportedly read and magazines subscribed to from within the home. The third factor has been named “Verbal Background” because of the pattern of loadings for aspects of verbal stimulation in the home, while the last factor has been named “Practical Background” because the two variables with which it correlates highly are hobbies and ownership of a bicycle.

Discussion

The principal finding of this study is that for a sample of Canadian boys representing three major levels of socioeconomic status in a Canadian city, a limited set of environmental variables generated congruent factorial structures. Accepting that certain limitations are evident, it is implied that environmental variables may be categorized in a similar fashion for contrasting socio-economic levels.

There are several important limitations which restrict the generalizability of this study's findings. Firstly, a set of environmental variables was selected from an initially relatively small pool of items and subjected to analysis after it had been determined that these variables related in the most part to certain cognitive test scores. Replication of this study with another subject sample is suggested in order to check these relationships.

Secondly, the factors emerging in this study may be in part a function of the sample tested. Only boys were tested, all coming from an urban environment—however it should be stressed that a relatively large and socioeconomically representative group was selected. Perhaps of greater significance than sample limitations are limitations stemming from the method used to assess environmental variables (self-report questionnaire). Further research to examine similarities between factorial structures descriptive of the environment might very well take account of different techniques of assessment such as rating scales and direct observation techniques.

Although two methods have been used to compare factorial structures, it seems evident that the second was more successful in that emergent factors were more meaningful. Where exploratory research is being carried out and it is not necessarily desirable to consider one pattern as "standard", the mutual rotation technique may well continue to prove more fruitful.

Finally it may prove useful to conceive of the environment in terms of equally salient and meaningful factor variables as they functionally relate to specific behavioral characteristics. In the present study there was a tendency for factors to be defined by variables which might be considered as resources present as part of the child's background, and by variables representing operations actively performed by the child in interaction with his environment.

This finding suggests that the environment is most fruitfully examined in a context of the individual's transactions with it, and the functional consequences of these for his behavior in the long run.

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Education in the Northwest Territories

REVIEW ARTICLE

The author reviews three major documents on education in the Northwest Territories published recently by The Territorial Government, and points out a few basic issues which require closer examination. (Dr. Bhattacharya is Professor of Philosophy of Education in the Department of Educational Foundations, The University of Alberta.)

Introduction

My primary aims in this essay are to bring to the notice of educators and research workers three recent documents containing information and recommendations about education in the Northwest Territories of Canada, and to point out what appears to me from a study of them to be some of the basic problems awaiting careful consideration. The documents are: *Survey of Education—Northwest Territories, 1972* (hereafter referred to as SE) prepared by the professional staff of the Department of Education, Government of the Northwest Territories; the *Report of the Special Committee of the Council of the Northwest Territories to Study the "Survey of Education—Northwest Territories"*, January, 1973) (hereafter referred to as RSCC; and "a hand book of Curriculum Development" entitled *Elementary Education in the Northwest Territories*, (recent but undated) published by the Curriculum Division, Department of Education, Government of Northwest Territories (hereafter referred to as EE). The three documents together comprise about 600 closely typed and printed pages, and contain the latest collected data on various aspects of northern education and a variety of recommendations. Any one interested in studying the educational system in N.W.T. or in exploring its many problems will find these documents immensely useful.

The Challenge and Response: A Summary

For nearly two decades a programme of free universal public education has been in operation in the vast expanses of Canada's Northwestern Territories. In quantitative terms the achievements of the Federal Government

so far are beyond reproach. New schools and residences both small and large, housing for teachers (and low-rent housing for Indians and Eskimos), airfields and other means of transportation, advanced expensive facilities, including the Anik satellite, for communication have been built; the administration of education has been transferred from Ottawa to Yellowknife in N.W.T.; the enrolment of school age children has risen from about 10-15 percent in 1949 when the Federal education programme started to a figure between 95 and 98 percent by 1971; and new offerings in kindergarten, vocational, and adult education have gradually been introduced in the schools. However, there has all along been great confusion and uncertainty as to the precise purpose or goal of education for the native population of the north; statements on needs, objectives, and requests remain to this day conflicting, often contradictory; and there has not yet been any clear and generally agreed formulation of basic aims and procedures for northern education. In the circumstances of the north where native non-European-Canadian people are the majority, but are divided amongst themselves by race, culture, language, and a wide variety in living conditions, the aims and priorities of formal education and of economic and social life cannot emerge without significant and sustained efforts by the government, industry, social reformers, teachers, and above all the people themselves. The documents can therefore be seen as an initial move in the right direction.

Survey of Education—Northwest Territories, 1972

The SE is the work of staff members of the N.W.T. Department of Education. It took about a year and a half to prepare, beginning in the spring of 1970. While the evaluation of the present programme, and the formulation of general principles for the whole of the Northwest Territories were undertaken by the staff at Education Headquarters in Yellowknife, a similar task for each area was undertaken by the teachers, supervisors, principals and superintendents of the areas concerned. The final result is the outcome of a two-front approach, and constitutes a set of observations and recommendations representative of the views of the majority of those directly involved with education in the north.

The SE comes in a format currently fashionable, namely, statements of recommendations on one side, with comments, explanatory notes and supporting material on the other. The contents of the SE cover almost every aspect of formal education: the purpose of education; the pre-school, elementary, secondary and continuing (i.e., vocational, higher, special, and adult) stages of education; curriculum development; school buildings and school supplies; residence and maintenance; teacher training; counselling and guidance service; classroom assistants programme; financial resources; administration at various levels; local involvement in education; and the Territorial Schools' Ordinance. The document also contains an impressive amount of factual information and statistical data about the development of school systems in the north. It reproduces in a final section verbatim copies of the sixteen briefs including one by the Northwest Territories Teachers' Association, and thereby helps the readers to secure some insight into the educational progress and problems in the

different regions of the Territories. The document contains recommendations for changes and improvements in many aspects of northern education including the main objectives "which will reflect the stated wishes of the northern population served by the Territorial Department of Education" (p. 4). The individual briefs in many cases make further recommendations designed to meet the exigencies of local and regional educational institutions. On the whole, the SE is a well-planned and carefully worded document which deserves wider attention than it has received so far; it also demonstrates the sort of concern and dedication on the part of many educators in the north that merits special recognition.

*Report of the Special Committee of the Council
of the Northwest Territories to the Study "Survey of Education—
Northwest Territories" 1973*

The Commissioner of N.W.T. appointed in October, 1972 a Special Committee of the Council of the Northwest Territories to examine the recommendations made in the SE and report back to the entire council. The Special Committee consisted of four members: Mrs. Lena Pederson (chairwoman), Dr. Louis-Edmond Hamelin, Bryan Pearson, and James Rabesca. Meetings of the Special Committee were held at Yellowknife on November 19-24, 1972. One member, Dr. Hamelin, was unable to attend the meetings; however, he sent his comments on the first draft report prepared by the three other members. A summary of his comments is published as Appendix B of the RSCC.

The RSCC is the result of the review by the members of the Special Committee of the many proposals for reform, reorganization, and improvement of existing conditions and opportunities made in the SE. While many recommendations are accepted without modification, and some are even designated as "top priority", the RSCC does not agree with some very fundamental positions taken by the authors of SE on matters of educational objectives, medium of instruction, with some specific details on matters relating to adult education, teacher training programme, and also with the proposed location of a community college to work in affiliation with southern universities. For those who may not be aware of the recently adopted policies on education by the N.W.T. Government, it must be noted that, among others, the following recommendations of the RSCC have already been accepted by the N.W.T. Council:

The Committee recommends that grade 9 should be provided in all communities in the Territories. At this level it should be determined in what direction the student will proceed, academic or vocational. Taking into consideration the student's age, those continuing in academics could be sent to another community to attend high school and study in a hostel; those wishing vocational training could attend courses in regional centres (RSCC, p. 6).

and

Again, the Committee expressed strong disagreement with major emphasis placed on teaching English language. The mother tongue of the native people must be retained and English should not be the first priority, especially during a child's first few years of school. The emphasis must be on his own language during this period. After a solid background in his mother tongue is developed, English can be given more emphasis (RSCC, p. 8).

The Special Committee also noted that it “does not approve of hostels” (RSCC, p. 17). The Commissioner of the N.W.T. has since announced a policy of building smaller schools in as many settlements as possible to allow the children to live with their parents. The RSCC is against compulsory school attendance as well, and it recommends that

When parents must leave a settlement to earn their living on the land, they should be encouraged to take their children with them whenever possible. This should be considered part of the child’s education. . . . It is far more beneficial for children to go with their parents than to stay in school to be taught by white teachers (RSCC, p. 17).

While these policies, on the whole, reflect concern of a certain kind, it can be argued that all of them may not *in practice* prove compatible with the aim of equipping the native population of the north “to live in the ever-changing and rapidly developing North and the rest of Canada”, or that the language policy in particular is not quite feasible as there are at present not enough native or non-native teachers, counsellors, and classroom assistants knowledgeable in the many native languages. And, again, some native languages are already dead, some are fast dying out, and around Cambridge Bay, I am told, the native language has already acquired a pidgin character. Are they all worth reviving or retaining? And also, to what extent is the native northerners’ life today “their traditional way of life”? It certainly sounds very unfortunate that any people should lose “their cultural heritage”; but, again, is there a culture anywhere in the world whose every single feature is or can be shown to be worthy of respect and retention? The purpose of education is to preserve and transmit the worthwhile, and this requires continual consideration of conditions and criteria relevant to changing situations. It is precisely on these grounds that the Special Committee finds it necessary to reject an educational policy for the north “based on southern-oriented system.” However, its own appeal to the “cultural heritage” and “tradition” of the northern population requires closer examination and evaluation. For uncritical and emotional appeal to “the tradition” can be used to justify anything from an oppressive dictatorship in some countries to a system of education designed to keep a large number of native people in the north occupied with increasingly unrewarding older patterns of life. The RSCC’s policy recommendations raise these and similar questions.

*Elementary Education in the Northwest Territories: A Handbook
for Curriculum Development*

This handbook possibly came into circulation in the beginning of the 1971-72 school year, and certainly before the RSCC’s recommendations on the native child’s first acquiring a “solid background in his mother tongue” and lesser stress on learning the English language at the “first few years of school” were adopted by the N.W.T. Council. For the handbook provides a time-table for daily language instruction from Year One, which includes teaching of English as a second language with 10% of the time devoted to it in the first year and gradually taking over 90% of the language teaching time by the seventh year. (EE, pp. 85-86.) While the “Language Arts” section of the handbook does exhort the teacher to “re-

spect the dignity of the child's first language", it does not provide any adequate guide-lines for the teachers to teach the many native "first languages". This would be an extremely difficult task as (i) "within each language there are dialectic differences"; (ii) "two or more languages have become integrated to the extent that a local functional language has developed. . . . the prime example of this is found in the Mackenzie Delta where English, Eskimo and Loucheux have become integrated to the point that a 'Deltanese' language is recognizable"; (iii) "certain languages are falling into disuse"; (iv) "the Athabaskan languages are employed almost exclusively in their oral forms with no written forms commonly employed". (EE, pp. 80-81.) The authors of the handbook are closer in their thinking on language teaching to the recommendations made in the SE than to those made by the Special Committee, though the latter have now become the official policy in the N.W.T. The authors of the handbook were certainly aware of the fact that they were formulating a loosely organized "compromise" curriculum, but they made no attempt to hide the stark political realities of northern life. On the question of language they have this to say:

The language by which you "Get Ahead" in the North is English. Whether you want an education, a job, mobility in terms of the larger Canadian society, or what-you-will, in the final analysis what happens to the individual will be almost solely dependent upon his competency in the English language. Certainly from a school point of view alone, the student's success or failure in terms of his education will rest almost entirely on his ability to master the English language. (EE, p. 81.)

In all its essential features the N.W. T. today is a semi-colonial political society—only more complex culturally and much more vulnerable to direct and rapid exploitation than were the many remote possessions of the colonial powers in the past centuries. A revealing "Introduction" to the EE outlines these features in abundant clarity: "A quick tour of any settlement will reveal the disparity in housing conditions between native and non-native residents"; "Even more obvious, is the housing segregation characteristic of many settlements . . . In too many settlements it is possible for the teachers to go back and forth to work each day and literally never set foot in the real community in which they live"; communities "may well be over-organized to the point where the people are confused"; "How can you expect me to know him? They all look alike to me" or the more familiar over-simplification, "well, they are Indians"; and the inferior treatment of the native people in numerous textual material—"If all the prejudiced material was to be summarily destroyed there would not be much left." And so on. (EE, pp. 8-15.)

I have noted earlier that the EE is a "compromise curriculum". In the absence of well-defined social, political, and economic goals for the majority of the northern population, it is impossible for the curriculum designers to prescribe preferences or priorities stressing a minimum of common subjects, skills or attitudes to be taught in the schools. The goals in life for the average native northerner remain open in the years to come, as they are now:

. . . to choose among and between . . . the wage earning economy; trapping, fishing, hunting economy; guaranteed annual income economy, and leisure-oriented social living. (EE, p. 4.)

The emphasis naturally is on individual freedom: "the individual is free to make his choice". But to what extent are these "possible life patterns"—except a guaranteed annual income or permanent welfare—real alternatives to the natives? And to how many? The EE in the section on "Social Studies" provides an answer. The teacher, it says, would be seriously mistaken if he assumes that "recognition of the 'mosaic' was all that was required. The vital second step is to become aware . . . of the *realities* of Northern Living." (p. 254) The teacher is urged to keep in mind the realities which include the following: "economically, the life of the Northern people is controlled by a minority of Euro-Canadian population"; "politically, the major decision-making power has been the almost exclusive prerogative of the minority Euro-Canadian population . . ."; "the mass media exemplify, if not extol, a way of life foreign to the majority of northern residents . . ."; "stable, wage earning opportunities are relatively limited; most well paying jobs are held by Euro-Canadians"; ". . . the 'welfare state' is a fact of life for much of northern population in the sense that it provides the one source of steady income upon which people may rely". (EE, pp. 254-255; also p. 195.)

If the realities of northern society are not heart-warming, and not much has been said in these documents about the means of relieving them, the blame does not rest with the educators and curriculum designers. While the curriculum can be seen as the most essential component of an educational policy, in the sphere of developing or adopting any such policy it is not generally the professional educators who have the strongest influence. This explains in part, I think, why these three documents fail to reflect a consistent wider perspective on the whole subject of northern development though they all seem to convey an unmistakable sense of urgency in planning for northern education.

Buildings, Maintenance, and Supplies

Among the difficulties experienced by school administrators and teachers in the normal execution of their duties in many northern schools, some without doubt stem from the remoteness of locations and unfavourable climatic conditions, the general economic and cultural backwardness of the local communities, and a centralized bureaucratic system of administration. All the documents, particularly the SE and the RSCC, point out problems which can be seen as arising from one or a combination of these factors.

School buildings are a case in point. As the Northwest Territories Teachers' Association points out,

School buildings in the Northwest Territories are a prototype of traditional southern schools in architecture. Not always taken into consideration are the particular functions of the school rooms The northern climate creates a long season of indoor activities; activities demanding space for freedom of action. (SE, p. 211.)

The SE recommends building standards which should take into consideration "special requirements of the N.W.T. education programme, the needs of communities which we serve, and the particular geographic and climatic conditions under which we operate." (SE, p. 75). It appears that

in matters of sites, design and furnishings, there has been little or no consultation in the past between the architects and informed teachers. In most areas, "the harsh cold and long dark days . . . confine the students to indoor activities mainly". In most settlements a school house is the only building that can serve as a community and youth centre for cultural and recreational activities. The more suitable a school house is for community activities, the easier it is for the school to increase and to maintain local interest and involvement in its work. The Special Committee appears to be appreciative of these considerations, and in agreeing with the recommendations made in the SE on school construction, it observes:

The structures that are being built in the north look very temporary and the Committee felt that we should be building more permanent type units. Pre-fabricated material being shipped into the North must of necessity be very sturdy to withstand the banging around it usually gets during shipment. Because of this the cost of shipping is very high. The use of northern materials in those areas where available would greatly reduce this expense. (RSCC, p. 18; also p. 4)

Lack of adequate arrangements for proper maintenance of buildings and equipment appears to be another matter of great concern. One school brief points out that "maintenance of schools and staff housing in the north is very poor" (SE, p. 198), and the same appears to be true of many student residences. (SE p. 70). Another brief states, "Any repair or maintenance work sometimes took months to get done or went undone. Work started has been often uncompleted." (SE, p. 194). At present, it appears, there are not many caretakers able to perform simple repair and maintenance works in the schools; maintenance services are not locally available in most places. As a consequence, equipment often falls into a state of disrepair; requests for funds and service personnel must pass through more than one government department before the request is approved. Both SE and RSCC recommend measures including training for custodial staff in maintenance and management procedures. Teacher housing in the north—which often dictates the number of teachers that could be hired—is often sub-standard, and is a major factor in causing teacher discontent. The Special Committee agrees with the recommendations that the N.W.T. Government must place high priority on a programme of adequate teacher housing and "adopt a policy of preventive maintenance of housing units, rather than follow the present policy which seems to be one of maintenance by crisis." (SE, p. 80; RSCC, p. 20).

Several briefs point out the difficulties experienced in obtaining school supplies—textbooks and other educational and co-curricular materials, maintenance requirements including cleaning materials. (SE, pp. 162, 176 and 194). One brief states:

Schools are required to have their annual requisitions completed usually not later than January 31. Why then do purchase orders for many of these items not come through until the end of August? Why are many requisitions not even approved until this (?) date? (SE, p. 194)

There seems to be confusion and disagreement about food rations policy for teachers. The SE favours a consistent procedure for determining the teachers' eligibility for food rations, (p. 81) but the Special Committee recommends a complete elimination of rations. It suggests that

Teachers should receive full information of what is available in their assigned community before proceeding to their destination so that they may purchase what is required. (RSCC, p. 21)

The Special Committee, for reasons not quite clear, seems to be least interested in one matter close to most people's heart, namely, food. I have no idea what its views are, as there is nothing on record, concerning a recommendation made in the SE for the elementary school level:

That each child be provided with a school lunch and such other food and/or vitamin supplements as may be deemed necessary during the school day. (SE, p. 29)

While the RSCC is silent on the subject, the EE warns teachers in its section on "Health":

To teach Canadian food rules, or some other arbitrary standard, makes little sense if the students are living at bare subsistence standards. For example, to feature orange juice, toast, bacon and eggs, and a tall tumbler of milk on a bulletin board display and thereby convey the idea that this is what constitutes breakfast is as pointless as it is heartless . . . the health teacher must begin with the known and the possible rather than the foreign and the ideal. (SE, p. 47).

The "known" and the "possible" are listed as tea, bannock, and fish. The health curriculum, as the EE contends in introducing the subject, "is regarded as being potentially the most delicate aspect of the school program." And this, in fact, says a lot. It should not be surprising that teachers from outside the north do not want to work for more than a period of two to four years in such an indigent environment, which some of them may find personally embarrassing.

What steps are in the right direction?

Until recently the general aim of native education in the Northwest Territories was some kind of assimilation or integration; consequently, the northern education programme was content to depend heavily on established practices in the southern provinces. This was convenient to the many southerners who had moved into the Northwest Territories (and who held the economic power) as they expected their children educated in a manner which would enable them to return and live effectively in the southern provinces later. However, within more recent years there has been a significant change in the outlook of the Federal Government and a large segment of Canadian people towards minority ethnic cultures. One of the most important features of the new outlook is the disposition to preserve native languages and cultures, and as far as possible their traditional ways of life. This has naturally led to some quick rethinking of the objectives and emphases of the northern educational system. The documents under consideration are an indication of the efforts to bring educational policies closer to the new moods and convictions.

The Aims of Education

Educational aim-statements everywhere are often phrased in such generalities or expressed by use of 'virtue words' that their full implications cannot be grasped without some detailed analysis or a close examination of the procedures recommended for achieving these aims. The goals of

northern education proposed in the documents abound in phrases suggesting shining ideals: opportunity for maximum development, satisfying personal life, restoring pride, self-respect, and confidence, preservation of cultural heritage, appreciation of the sum total of human experience, preparing participating members of a rapidly changing complex society, creating good leaders and good citizens. The language testifies to the newly-found social goals of a multicultural nation. Understandably, Canadians of good will are looking towards the classrooms to contribute directly to the attainment of these goals. But are the proposed aims quite compatible? Are the recommended procedures—in this period of poverty, unemployment, and inequalities in the north—adequate in practical terms for reversing the present social tendencies?

Consider, for example, one stated objective of northern education. The RSCC puts it this way:

To have the opportunity to adapt to the white man's way *but* without losing their traditional way of life, their own language, and their cultural heritage. (RSCC, p. 2).

The question is: How does the educator combine one side of the *but* with the other? The SE and the EE, as we have noted, stress the need to teach English along with the mother tongue from the first year of schooling. The RSCC rejects this recommendation as "not desirable". Instead, it urges the promotion of the many native languages to the extent to suggest that "the Government, whenever possible, in its dealings with the native peoples should endeavour to communicate with them in their own language." (RSCC, p. 2). And, how does the school go about reconciling "the white man's way" with the native peoples' "traditional way of life"? Interestingly, the EE provides a comparison table of ten fundamental values of Euro-Canadian and Athabaskan-Eskimo societies which are clearly conflicting. (EE, pp. 7-8). Can a simple *but* brush away these fundamental differences? It is indeed difficult to imagine that the proposed procedures would bring any significant change at the higher education level, which as at present can be seen from the following figures.

TABLE 1
HIGHER EDUCATION ASSISTANCE
STUDENT GRANTS

Year	Total	Indian	Eskimo	Other
1967-68	67	-	1	66
1968-69	97	-	1	96
1969-70	116	7	2	107
1970-71	109	3	1	105

(SE, p. 148)

This foreboding is confirmed, indirectly but nonetheless pointedly, by a member of the Special Committee, Dr. Louis-Edmond Hamelin. He argues that

. . . a special system for the native students will not be the ideal system for the white students . . . However, despite the cost and the complicated structure required, it may be necessary to have two systems in order to provide equality among the set of Canadian cultures. *If*, on the other hand, the indigenous people want to receive this instruction and education in the dominant language in Canada, i.e., English, only one system is necessary. (RSCC, Appendix B)

The smooth sliding unexamined *but* seems to become in the more realistic market language a stumbling *if*. The issue has to do with language, and what may have appeared to the majority of the Special Committee as a matter deserving emphasis—cultivation of native languages and cultures—becomes in the eyes of Dr. Hamelin “a special system for the native students”. He is skeptical of the cash value of the proposed priorities, and in a businesslike manner makes it clear that southern whites coming to the north have little to gain from an education designed for a people who “are between two cultural ages”. He has a point. It can be argued, I believe, that all the high-minded aims notwithstanding, in realistic terms the recommended educational priorities and procedures are well behind the times; the new education may succeed at best in transforming the original inhabitants of the north into a new industrial proletariat, and nothing more. It must be realized that any enthusiasm for his partly destroyed cultural heritage is not going to help the native northerner to break through the firmly entrenched cultural, economic, political, and other barriers that stand in the way of his joining the mainstream of Canadian life.

Curriculum Development

For many years the schools in the north worked with borrowed and externally imposed programmes and standards. Any innovation in curriculum, or the introduction of “unauthorized” reading material by teachers was not only discouraged, but punished. Section 114 of the N.W.T. School Ordinance, which seemed to believe in “destroying the atmosphere to prevent fire”, stated unabashedly:

A teacher, trustee or other person who uses or causes to be used an unauthorized textbook or reference book, either in the place of or to supplement an authorized textbook or reference book upon the same subject, shall be guilty of an offence, and liable on summary conviction to a fine not exceeding twenty-five dollars and costs, provided, however, that no prosecution under this section (will take place) except by order of the Commissioner. (Quoted in SE, p. 193)

The current endeavour of the Curriculum Division of the N.W.T. Department of Education, which is producing a curriculum guide for junior high school for the 1973-74 school year, has no help from previous programmes, co-ordinated research or serious discussion of the many educational issues related to the circumstances of contemporary northern life. In fairness, one should be patient with pioneering efforts. However, a word of caution is appropriate, particularly in view of the intensive drilling, extensive piping, and the rest the north seems destined to put up with in the future. The EE, as I have noted, offers a realistic portrait of the life of native northerners. But its recommendations, based on a principle of “parity” or “equal time” to be given the various cultures and languages, reflect an attitude of conscience-ridden hesitation. It appears unsure in some other respects as well. The main theme “reinforced in the minds of all educators

time and time again", that "Northern education must reflect the needs and aspirations of all children" is distressingly vague, and can be understood in a variety of senses. What the curriculum builders should have been aware of is the lamentable fate of educational slogans of this sort. They can be used as well-greased chutes to help generations of unconsulted children to slide into the cave of poverty, unemployment and dependence. If an expensive programme of formal education in the north cannot enable the majority of native children to evade such a future, the whole exercise is almost pointless.

Classroom Assistants: Are the Barriers Uncrossable?

Classroom assistants act as interpreters between the teachers and young children, explain the actions of the school to the adult members of the community, review exercises, supervise seating arrangements and play activities, and "undertake some of the purely mechanical tasks". They have been in the employ of N.W.T. Department of Education since 1958. The number of assistants in the school year 1971-72 was 70. With the introduction of pre-school education in some areas, and emphasis on the teaching of native languages, the number of assistants is bound to increase at a fast rate in the near future. These assistants perform two essential functions: in many classrooms in the north teaching and learning are possible only through them; and in many areas they are the only source from which the teachers can acquire some knowledge and understanding of the local language and culture. They are mostly young native persons who can communicate in English or French and in a native language. They receive an initial on-the-job training. Some of them have been working for four years or longer. However, they do not as yet enjoy any Public Service pay schedule, nor the rights and privileges of the teaching personnel. "Housing is often a problem for the assistants . . ." (SE, p. 90).

Quite understandably, all the documents and the individual briefs appended to the SE devote considerable attention to the necessity of employing classroom assistants, the procedures for recruiting and training, their roles in the classroom and with the community outside, their status, pay, and other privileges. But there is little about the possibility—except in one brief (SE, p. 159)—of their academic upgrading and obtaining certification as teachers. Both the SE and RSCC recommend that classroom assistant programmes be accepted as a "necessary, integral and continuing part of the total education programme". "Every school in the Territories with inter-cultural classrooms should have at least one assistant available by the 1973-74 school term" (SE, p. 90; RSCC, p. 24). The RSCC also recommends that the salaries of the assistants be "increased to an acceptable level", and that they "should also participate in an annual teachers' conference". In the same context, while urging that "the number of native northern teachers should be increased to as many as possible", it suggests:

Although a lowering of standards is not desirable, some compromise might be affected to certify as many as possible under the Territorial Teacher Education Programme but not for all of Canada (RSCC, p. 2).

However, it does not propose that experienced classroom assistants who show promise should have the opportunity to qualify as certified teachers. The brief of the N.W.T. Teachers' Association asks for "pre-service bur-

saries . . . to prospective teachers to take . . . northern oriented courses”, but only accommodation and training for the native classroom assistants “for as long as they are needed” (SE, p. 211). Are we to assume that prospective teachers who need northern oriented courses will be able to teach native languages and courses dealing with native cultures? Why, one may wonder, in the context of “parity” of cultures and languages, does not the RSCC urge the development of school texts in the native languages? There appears to be a gap between the educational policies adopted by the N.W.T. Council and the rather half-hearted measures suggested in the Report.

Teachers and Teacher Training

Data for 1970-71 show that a great majority of teachers in the non-municipal schools in the N.W.T. are Canadians, and have Canadian teacher certificates. Of 496 teachers, 424 had their initial training in Canadian provinces (only 5 in N.W.T.); 6 in the U.S.A.; 41 in the U.K.; the rest are from Australia, New Zealand, the Philippines, India, and Europe. It may be of interest that among these teachers are 70 married couples, 34 single males, 118 single females, and 6 Sisters. The large majority are below 30 (average age 30.91); they earn an average salary of \$10,182.92 per year. The student-teacher ratio in N.W.T. schools, as the following figures indicate, has consistently been satisfactory:

TABLE 2
STUDENT-TEACHER RATIO - NORTHWEST TERRITORIES

Year	Teacher	Student	Ratio
1966-67	366	6880	18.74
1967-68	409	7608	18.60
1968-69	445	8212	18.45
1969-70	499	9100	18.23
1970-71	532	10056	18.70

(SE, p. 139)

One disquieting feature in the northern educational scene is that the teachers do not stay there for more than a few years. As a result the system suffers from the inexperience of the teachers. The following table illustrates the point.

The proposals (SE and RSCC) to reduce teacher turnover do not go beyond modification of certification rules, methods of salary classification, and the like. An example of negative thinking is the suggestion to place an increased share of financial responsibility for removal expenses on the teacher to discourage him from moving out. There are no concrete suggestions of incentives to make northern schools attractive to people interested in exploring fresh ideas or experimenting with new methods. The Special Committee wants to see more northern trained native teachers as “it is unlikely that such teachers would want to move to the south to work anyway” (RSCC, p. 10).

The idea of having northern trained and more native teachers is consistent with the new educational policy, and certainly sound in principle.

TABLE 3
EXPERIENCE OF TEACHERS BY YEARS
IN NORTHWEST TERRITORIES

No. of Years in N.W.T.	No. of Teachers	Percentage
1	177	35.97
2	126	25.61
3	67	13.61
4	43	8.74
5	20	4.06
6	10	2.03
7	9	1.83
8	8	1.62
9	10	2.03
10	5	1.01
11	4	.81
12	6	1.22
13	2	.40
14	3	.61
15	1	.20
18	1	.20
Average - 2.95 years		

(SE, p. 142)

This would not necessarily mean, as far as I can see, an immediate lowering of teaching standards. There is a need for a new policy of teacher evaluation, for salary classification, and other related matters. The documents are rather ambivalent at this point.

The need for a unique educational policy for the north has been thoroughly canvassed in the documents, and has been largely accepted by the N.W.T. Council. A southern system of education for the north has been rejected as both inadequate and undesirable. Teachers from southern Canada have been found to be ill-equipped, and southern counsellors "most ineffectual in their role in northern schools". As a result, southern school programmes are in the process of being replaced at every level of northern education by new programmes which would hopefully "provide appropriate learning experiences" for northern students. But these schemes are not accompanied by decisive efforts to bring corresponding changes in policies embracing the criteria of teacher education, performance and classification. True, there is at present a N.W.T. Teacher Training Programme, but little is said about its adaptability and resources. Both SE and RSCC recommend continuation of the close liaison with The University of Alberta. But speculation about problems and possibilities is no substitute for decisive action.

Review Notices

BOOKS ON CANADIAN EDUCATION

HISTOIRE DE L'ENSEIGNEMENT AU QUEBEC: 1840-1971.

By L.-P. Audet.

2 volumes. Montreal: Holt, Rinehart and Winston, 1971, pp. 432 and 496.

This is a beautifully produced, and illustrated, history of education in Quebec province in which the distinguished author relates the public events and personalities to the underlying, and often conflicting, philosophies and to the historical roots in European thought. The first volume provides the historical background and European heritage of the French and Anglo-Saxon *colons*. It brings the story up to the conquest of Quebec (1760) and the Act of Union (1840). Volume Two discusses the development of educational provision and thinking from 1840, the growth of the two systems of education (1876-1959), closing with an analysis of the reforms of 1959-1971. The treatment is balanced, factual and concerned with the basic problems of the system—laws, personalities, educational philosophy, general social conditions. Reading lists are appended to each chapter. This is an ideal text to place in the hands of undergraduate and graduate students, and as jumping-off ground for research in this area.

EDUCATION: ONTARIO'S PREOCCUPATION.

By W. G., Fleming.

University of Toronto Press, 1972, pp. 330, \$10.00.

ONTARIO'S EDUCATIVE SOCIETY VOL. VI: SIGNIFICANT DEVELOPMENTS IN LOCAL SCHOOL SYSTEMS.

By W. G., Fleming.

University of Toronto Press, 1972, pp. 306, \$12.50.

ONTARIO'S EDUCATIVE SOCIETY VOL. VII: EDUCATIONAL CONTRIBUTIONS OF ASSOCIATIONS.

By W. G., Fleming.

University of Toronto Press, 1972, pp. 463, \$14.00.

These are two volumes of a seven-volume set dealing with the history, structure, personnel and activities within the system of Ontario's "educative society". The first title is a companion work, constituting an introduction to the series. This ambitious enterprise is the most comprehensive study of any educational system and provides not only massive collections of materials but also an analytical model for future studies of education in other provinces.

DIRECTORY OF EDUCATION STUDIES IN CANADA; 1971-1972.
Canadian Education Association.
Toronto, 1973, pp. 120, \$5.00.

This annual classified and annotated bibliography is the largest to date. One thousand studies are listed under relevant headings. Unpublished theses and mimeographed materials are listed. The directory is useful in a great number of ways—probably most of all in making communication easy between people working in the same research area.

CONTEMPORARY QUEBEC: AN ANALYTICAL BIBLIOGRAPHY.
By J. Cotnam.
Toronto: McClelland & Stewart, 1973, pp. 112, \$2.95.

Six pages are devoted to education, teaching and the school system in this comprehensive bibliographical guide to all aspects of contemporary culture, politics and society in Quebec Province.

Books for School and College Libraries

MATHEMATICAL THOUGHT FROM ANCIENT TO MODERN TIMES.
By M. Kline.
New York: Oxford University Press, 1972, pp. 1,238, \$38.50.

The text makes no concessions to the non-mathematical reader who is interested in the social and technological origins of mathematical thought. It is a high-level mathematical presentation organised chronologically by period, school or personality. From the recorded beginnings of mathematical thought in Babylon to the twentieth century the contributions of the great, as well as the more minor figures, are analyzed. Peripheral philosophers, like Kant and Hume are briefly referred to; physicists like Helmholtz, Hooke and Galileo take a bow at the appropriate places; but the emphasis is on the “*rigour of the game*” in Mrs Battle’s phrase.

ENDANGERED SPECIES.
By W. Ullrich, and Tylinek E., and I.
New York: Hart Publishing Co., 1972, pp. 284, \$15.00.

This is a beautiful collection of photographs and descriptions of the species of animals now under threat of extinction, largely as a result of the depredations of man in his predatory aspect. The only criticism one could possibly make is that *Homo sapiens* himself is not represented.

OTHER BOOKS RECEIVED

Books included in this list may be reviewed in a future issue.

C. M. BECK, B. X. CRITTENDEN, and E. V. SULLIVAN, *Moral Education: Interdisciplinary Approaches*, New York: Newman Press, 1971, pp. 402.

W. HAROLD BERNARD, *Psychology of Learning and Teaching*, New York: McGraw-Hill Book Company, 1972, pp. 500.

W. H. BURSTON, *Principles of History Teaching*, London: Methuen Educational Ltd., 1972, pp. 219, \$7.95 (cloth), \$5.65 (paper).

ROBERT E. CLARK, *Reference Group Theory and Delinquency*, New York: Behavioral Publications, Inc., 1972, pp. 129, \$9.59 (cloth), \$4.95 (paper).

D. C. CUSHENBERY, and K. J. GILREATH, *Effective Reading Instruction for Slow Learners*, Springfield: Charles C. Thomas, 1972, pp. 167, \$6.75.

W. B. ELLEY, and I. D. LIVINGSTONE, *External Examinations and Internal Assessments*, Wellington: New Zealand Council for Educational Research, 1972, pp. 192.

JAMES FREEMAN, H. J. BUTCHER, and T. CHRISTIE, *Creativity: A Selective Review of Research*, London: Society for Research into Higher Education Ltd., 1971, pp. 174.

P. FREIRE, *Cultural Action for Freedom*, England: Penguin Education, 1972, pp. 91, U.K. price 30p.

P. FREIRE, *Pedagogy of the Oppressed*, England: Penguin Education, 1972, pp. 153, U.K. price 40p.

C. E. IZARD, *The Face of Emotion*, New York: Appleton—Century—Crofts, 1971, pp. 468, \$14.95.

D. B. KENNEDY, and A. KERBER, *Resocialization: An American Experiment*, New York: Behavioral Publications, Inc., 1973, pp. 191, \$9.95 (cloth), \$4.95 (paper).

G. KEPPEL, *Design and Analysis: A Researcher's Handbook*, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1973, pp. 658.

W. R. LOOFT, *Developmental Psychology: A Book of Readings*, Hinsdale, Ill.: The Dryden Press Inc., 1972, pp. 493.

J. McLEISH, W. MATHESON, and J. PARK, *The Psychology of the Learning Group*, London: Hutchinson & Co. (Publishers) Ltd., 1973, pp. 221, \$6.75 (cloth), \$3.40 (paper).

P. NEWELL, *A Last Resort? Corporal Punishment in Schools*, England: Penguin Education, 1972, pp. 198, \$2.50.

J. L. POWELL, *Selection for University in Scotland*, University of London Press, 1973, pp. 104, U.K. price 80p.

W. F. PROKASY, *Classical Conditioning: A Symposium*, New York: Appleton-Century-Crofts, 1965, pp. 421, \$8.95.

M. REUCHLIN, *Individual Orientation in Education*, The Hague: Martinus Nijhoff, 1972, pp. 75.

H. SILVER, and S. J. TEAGUE, *The History of British Universities, 1800-1969, A Bibliography*, London: Society for Research into Higher Education, 1970, pp. 264.

B. F. SKINNER, *Cumulative Record: A Selection of Papers, Third Edition*, New York: Appleton-Century-Crofts, 1972, pp. 604, \$12.95.

B. SPODEK, *Early Childhood Education*, Englewood Cliffs, N.J.: Prentice-Hall Inc., 1973, pp. 280.

B. STEFFLRE, and W. H. GRANT, *Theories of Counseling, Second Edition*, New York: McGraw-Hill Book Company, 1972, pp. 326.

J. M. STEPHENS, and E. D. EVANS, *Development and Classroom Learning: An Introduction to Educational Psychology*, Holt Rinehart and Winston, Inc., 1973, pp. 692.

B. L. TURNEY, and G. P. ROBB, *Statistical Methods for Behavioral Science*, New York: Intext/Chandler, 1973, pp. 214, \$6.95.

J. A. WILSON, *Banneker: A Case Study of Educational Change*, Homewood, Ill.: ETC Publications, 1973, \$7.75.

G. YARLOTT, *Education and Children's Emotion*, London: Weidenfeld and Nicolson, 1972, pp. 211.

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- Bergen, J. J., and Deiseach, D. *Dimensions of the High School Student's Role*. No. 1, March, 8-14.
- Black, D. B., and Goding, W. E. *An Experiment in Classroom Management*. No. 1, March, 15-29.
- Blowers, E. A. *Barriers to the Education of Children from Low Income Families*. No. 1, March, 30-34.
- Bowd, A. D. *Some Determinants of School Achievement in Several Indian Groups*. No. 2, June, 69-76.
- Conklin, R. C., and Phelps, J. *Differences Between Applicants and Enrollees in a Mature Non-Matriculant Program*. No. 2, June, 77-81.
- Corfield, V. K. *Programmed Instruction as a Tool to Facilitate Perception of Alternatives*. No. 2, June, 82-90.
- Dawson, D. A. *Educational Quality Indices*. No. 1, March, 35-44.
- Forrest, A. *Clarendon's 'Dialogue Concerning Education': A Neglected Document in Seventeenth-Century Educational History*. No. 3, September, 211-222.
- Friesen, D. *Variations in Perceptions of Organizational Climate*. No. 2, June, 91-99.
- Goodlet, G. R. *Nongrading and Achievement: A Review*. No. 4, December, 237-242.
- Hickcox, E. S., and Ducharme, D. J. *Administrative Staffing Patterns in Ontario School Districts*. No. 2, June, 100-110.
- Humphreys, E. H. *Inequality and Rural Schools: Results of Surveys in 1967 and 1969*. No. 2, June, 111-123.
- Kennett, K. F. *Intelligence and Socio-economic Status in a Canadian Sample*. No. 1, March, 45-50.
- King, Ethel M., and Friesen, Doris T. *Children Who Read in Kindergarten*. No. 3, September, 147-161.
- Koziey, P. W., and Brauer, J. H. *Using Mental Practice to Improve Reading Performance*. No. 3, September, 190-195.
- Lehtiniemi, L. *A Tested Theory of Student Unrest*. No. 1, March, 51-58.
- Lemire, J. *Creativity and School: A Social Problem*. No. 4, December, 295-306.
- MacGregor, R. N. *A Review of Selected Art Tests and Evaluative Instruments*. No. 2, June, 124-132.

- Mackie, M. *School Teachers: The Popular Image*. No. 4, December, 267-276.
- Marjoribanks, K. *Achievement Orientation of Canadian Ethnic Groups*. No. 3, September, 162-173.
- Martin, J. F. *The Relationship Between Neuroticism and Attainment*. No. 4, December, 259-266.
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FACULTY OF EDUCATION
The University of Alberta

N. MEHRA

The University of Alberta

Socio-Psychological Correlates of Non-Medical Use of Drugs Among University Students

The contents of this article are improved and extended excerpts from a larger study "The Resident Student: A Study of Student Opinions and Reactions" completed by the author at The University of Alberta. The study was conducted on the Lister Hall resident student population in 1969-70 (and replicated in the following year) with a view to elicit student reactions to a broad range of social, cultural and educational issues including the non-medical use of drugs among students. The present article is written with three chief objectives in view: (1) To provide a general description of student involvement in drug usage, (2) To isolate factors significantly associated with drug-use, and (3) To detect those which contribute maximally to it. Two questionnaires and a personality inventory were used in the collection of data which were obtained from a stratified random sample of 282 respondents (17% of the resident population in Lister Hall complex). (Dr. Mehra is Research Director, Office of Institutional Research, The University of Alberta).

Introduction and Purpose

Few campus issues today concern the public and the intellectual community so deeply as the recent phenomenal increase in the non-medical use of drugs on university campuses. The public is naturally concerned to find out how pervasive the use of drugs is; that is, the extent, the frequency, and the conditions under which today's young people are taking drugs. The intellectual community is attempting to investigate who these young people are, the nature of their family background, their social and educational values and their personality disposition. At the heart of the issue are questions concerning conditions which contribute to the use of drugs and the role the university community should play in alleviating some of these conditions. The present article is an attempt to provide some partial answers to these questions. More precisely, this article is written with the following three chief objectives in mind: (1) To provide a general description of student involvement in the non-medical use of drugs; (2) To isolate

factors significantly associated with the use of drugs; and (3) To identify and detect factors which contribute to drug usage among students.

The contents of this article are improved and extended excerpts from a larger study "The Resident Student: A Study of Student Opinions and Reactions" completed by the author. This study was designed to collect and analyze student reactions on a broad range of social, cultural and educational issues including the non-medical use of drugs. The study was conducted on the Lister Hall residence student population in 1969-70 and was replicated the following year to check the reliability of the obtained results. The text of this article is based on the 1969-70 survey, with comments on the 1970-71 survey interpolated in parentheses wherever deemed necessary or appropriate.

Design for the Study

Two questionnaires and a personality inventory were used to collect data for the study. The information elicited was, for the most part, biographical and attitudinal. *Questionnaire 1* contained items concerning students' background characteristics, educational aspirations and achievement patterns. *Questionnaire II* was designed to elicit information of a personal and confidential nature, and included items on a broad range of social and educational topics. The *Personality Inventory* used was the 16PF Form A (1962) as developed by Raymond B. Cattell and Herbert W. Eber at the Institute of Personality and Ability Testing.

A stratified random sample of 282 persons (approximately 17% of the total residence population) was selected. Stratification was by sex and year of studies. Subjects were reassured regarding the anonymity of their answers and their identification was not required. A total usable response of 83% was obtained—a reasonably high response for the purposes of analysis.

Since the first two sections of this study were meant to be essentially descriptive, the data for these parts were analysed in the form of frequency distributions. To test the statistical significance of differences in two or more distributions, mostly the chi-square test for contingency was used. Generally speaking, only those items are included in the text of this paper, where the differences in two or more distributions were found to be significant at least at the 5% level. A few items which do not meet this criterion are nevertheless included in the text, since they indicate some interesting patterns or relationships. The methodology employed in the third section of this study is described and discussed along with the results.

Findings of the Study

I. General Description

A drug-user in this article is defined as a person who uses drugs without prescription on an experimental, occasional or regular basis.

Use of drugs other than alcohol and tobacco among resident students seems to be limited essentially to experimental sessions only, with regular use restricted to a small minority. One quarter (31.5% in the 1970-71 survey) reported using "soft-drugs" (marijuana, cannabis, hashish etc.)

during the preceding six months, 11% using them only once or twice. The pattern is more or less the same for sedatives, tranquilizers and amphetamines. The pattern for "hard-drugs" (LSD, opiates, heroin, and other hallucinogens) is quite different: only 2% reported having tried them. On the other hand, the level of general information on drugs was rather high (e.g., they knew the price of a "dime bag"). The largest group of drug contacts was residence friends (48% in 1969-70, up to 58% in 1970-71, reflecting increased availability).

Alcohol is obviously much more widely accepted than other drugs. While only a third reported using tobacco, 69% reported drinking once or twice a week. More than half of their consumption was in the residence halls. There was general support for lowering the drinking age to 18 years (The legal age was lowered to 18 in Alberta in 1971).

These results agree with the consistent trend of a number of studies. For example, Pearlman (1968) surveying graduates of Brooklyn College between 1962 and 1965, found that only seven percent had some illicit drug experience. Later, Eells (1968) found that 13.7 percent of all students at Cal Tech had used marijuana and 5.5 percent had used LSD. Imperi, Kleber, and Kavie (1968) in a similar study at Yale and Wesleyan found that 20 percent at both institutions had used hallucinogenic drugs. A study completed at McGill in 1970 found 29.5 percent of the students had smoked marijuana. In 1971, Kohn and Mercer found 50 percent at York.

Although most students who have used drugs have done so only infrequently, students in general seem to be aware of the drug culture and cognitive of its attributes. That this is so is indicated by their knowledge of colloquialisms and drug sources.

Contrary to the general belief, marijuana does not seem to be a substitute for alcohol, its users tending to be multiple drug users who look upon marijuana as "somewhat safe", alcohol as "less so", and tobacco as "somewhat unsafe".

Those who use drugs without a prescription do so to "feel good", or because of curiosity. They cite "awareness" as their dominant marijuana experience and "transcendence" as their dominant LSD experience.

Most respondents advocate some kind of restriction on the availability of marijuana. Most thought that LSD should be available for research purposes only.

They would "warn" their children if they found them smoking marijuana, and seek "clinical help" for a child on LSD. They tend to view people addicted to heroin as "sick".

Mass-media were reported as having the strongest influence on their attitudes towards the use of drugs. The information thus gained tends to be used to defend arguments for or against the safety of drugs.

II. Relationships

Background: Although the sample of "hard" drug users was too small to support definite conclusions, the sample of "soft" drug users was adequate to support a number of observations. The variables "sex" and "year of studies" appear to be significant factors ($p < .05$): significantly more men than women, and more freshmen than third or fourth year

students reported using drugs (cf. Eells, 1968). However, it should be noted that senior students are more highly selected than freshmen. The incidence of use was reported highest for the Faculty of Arts (as also found in the McGill study, 1970, and at Sir George Williams, 1969), and for Business Administration and Commerce, and lowest for Agriculture and Education in that order. Family socio-economic level was also found to be a significant factor: more drug users' fathers were in professional occupations, father's formal educational level was that of university level, and parental income was \$10,000 to \$25,000. These results also agree with others (Stef-

TABLE 1
BACKGROUND FACTORS RELATED TO DRUG USAGE

	Users (N=61)	Non-Users (N=171)	Total
<u>Sex</u>			
Male	37.7	62.3	50.5
Female	25.2	74.8	49.5
	Observed χ^2 value (1 d.f.)=4.96, P. < .05		
<u>Socioeconomic Variables</u>			
Father's Occupation?			
Professional	58.2	33.5	40.0
Proprietor	14.5	26.5	23.3
Clerical	10.9	12.3	11.9
Skilled	12.7	15.5	14.8
Semi-skilled	3.6	12.3	10.0
	Observed χ^2 value (4 d.f.)=11.91, P. < .02		
Father's Education?			
Under 6 years	32.8	45.2	41.9
High School	26.2	33.3	31.4
Graduate Work	9.8	7.1	7.9
1-3 years of University	31.1	14.3	18.8
	Observed χ^2 value (3 d.f.)=9.56, P. < .03		
Parents' Annual Income?			
Under \$10,000	37.9	51.6	47.9
\$10,000 - \$25,000	56.9	39.1	43.8
Over \$25,000	5.2	9.3	8.2
	Observed χ^2 value (2 d.f.)=5.61, P. < .06		
Financial Support for University Education			
Parents	43.2	36.4	38.2
Job	27.7	30.2	29.6
Loan	16.1	19.3	18.5
Grant or Scholarship	12.9	14.1	13.8

fanhagen et al., 1971; the McGill study, 1970; Sir George Williams, 1969) in that respondents' concept of God seemed a related factor ($p < .02$): more users than non-users were undecided about their concept of God. Greater "secularity" has also been a finding of a number of other studies on drug users (e.g. Kohn and Mercer, 1971; Milman and Anker, 1971). Sibling marijuana use was much higher for the users than the non-users ($p < .01$, Table 1).

Educational Aspirations: These drug users show an above average Grade XII Grade Point Average but scored lower in University ratings of achievement (cf. the McGill study, 1970). They reported studying fewer

TABLE 1 (continued)
BACKGROUND FACTORS RELATED TO DRUG USAGE

	Users (N=61)	Non-Users (N=171)	Total
<u>Year of Studies</u>			
Freshmen	62.5	44.4	49.1
Juniors	28.6	35.2	33.5
Seniors	8.9	20.4	17.4
Observed χ^2 value (2 d.f.)=6.43, $P. < .05$			
<u>Faculty</u>			
Agriculture	3.3	8.3	7.0
Arts	29.5	13.6	17.8
Business Administration & Commerce	8.2	4.1	5.2
Education	13.1	24.3	21.3
Engineering	9.8	13.6	12.6
Household Economics	6.6	5.3	5.7
Medicine	8.2	10.7	10.0
Science	21.3	20.1	20.4
Observed χ^2 value (7 d.f.)=12.92, $P. < .10$			
<u>Concept of God</u>			
What is your Concept of God?			
Supreme Being	49.2	66.3	61.7
Does not Exist	1.6	6.5	5.2
Undecided	32.8	19.5	23.0
Other	16.5	7.7	10.0
Observed χ^2 value (3 d.f.)=10.97, $P. < .02$			
<u>Sibling Marijuana Usage</u>			
Siblings taking Marijuana or Glue?			
Marijuana	19.0	7.6	10.6
Never Used Marijuana or Glue	48.3	76.6	69.0
Don't Know	32.8	15.8	20.4
Observed χ^2 value (2 d.f.)=16.05, $P. < .01$			

hours ($p < .05$), doing more free reading, spending more time watching T.V., and dating more frequently than non-users (*cf.* Milman and Anker, 1971). Though the figures are not always statistically significant, drug-users seem to give more weight to the importance of acquiring wider interests than scholarship as a part of university education; to be reasonably satisfied with their education at the university; but to be undecided about their future educational and career plans ($p < .01$).

Social Attitudes: Significantly more users than non-users regard marriage as a temporary or a communal situation; consider female virginity either unimportant or undesirable, prefer women as well as men to be sexually experienced when they marry; and are sexually more active (Table 2).

Personality Characteristics: The Lister Hall student population, both male and female, was found to be highly representative of the college student population in Alberta in respect of personality characteristics. The profiles for the drug-users, however, differed significantly from those of the non-users on two of the factors of the personality inventory, indicating the drug-users to be more "expedient" individually ($G;p < .001$) and "undisciplined" socially ($Q3;p < .05$) than the non-users. Thus, the user is characterized by a freedom from group influence that sometimes leads to antisocial acts, a refusal to be bound by rules, a disregard for social demands, inconsiderate carelessness and impulsiveness. The regular user may also feel that he is emotionally maladjusted.

Male users indicate a happy-go-lucky, impulsive, enthusiastic attitude not displayed by female users ($F;p < .05$). Male users have a forthright, unsophisticated, simple and spontaneous attitude towards life (Factor N). Female users tend to be imaginative, bohemian and careless of practical matters (Factor M). These findings are substantiated by comparing the reactions of the users and non-users to residence policies and regulations. Responses of drug users in this area consistently favoured a liberal, unstructured and undisciplined life in the residence.

These findings on student drug-involvement are in substantial agreement with the findings of studies on student drug-involvement on other Canadian and American campuses.

III. Predictors of Marijuana Usage

To delineate predictors of marijuana usage, 70 biographical and personality variables were selected and factor analyzed using the principal component method. The factor-matrix produced 24 factors with eigenvalues greater than unity. These factors accounted for 68% of the total variance among the variables. In addition, the communalities of the variables were quite high (usually over 0.7) indicating that most of the variance of the 70 variables was accounted for by 24 factors. Factor scores for each of the 521 subjects (subjects for the two surveys were combined for this phase of the study) were calculated. The factors were then assessed as predictors of marijuana usage using the simultaneous regression analysis technique.

Twenty-one percent of the variance in marijuana usage was predicted. This is a relatively small amount but considering that this battery of variables was not put together with this in mind, the results are not discouraging. Four factors were found to be particularly relevant to high drug

TABLE 2
VARIABLES RELATED TO ACHIEVEMENT

	Users (N=61)	Non-Users (N=171)	Total (N=232)
Grade Point Average (Grade XII):			
59 - 69	32.8	45.8	42.4
70 - 80	47.5	33.3	37.1
Over 80	19.7	20.8	20.5
Study Hours:			
1 - 5 hrs.	45.9	21.1	27.6
6 - 10 hrs.	21.3	28.1	26.3
10 - 20 hrs.	23.0	35.7	32.3
Over 20 hrs.	9.8	15.2	13.8
Observed χ^2 value (3 d.f.) = 14.03, P. < .05			
Number of Books Read:			
None	8.2	23.4	19.4
1 - 5	60.7	51.5	53.9
6 - 10	13.1	13.5	13.4
10 - 20	6.6	7.6	7.3
Over 20	11.5	4.1	6.0
Observed χ^2 value (4 d.f.) = 10.19, P. < .05			
T.V. Hours:			
None	9.8	22.2	19.0
1 - 5 hrs.	52.5	45.6	47.4
6 - 10 hrs.	19.7	22.2	21.6
11 - 15 hrs.	11.5	5.8	7.3
Over 16 hrs.	6.6	4.1	4.7
Dating Frequency:			
Several/week	41.0	31.0	33.6
Once/week	37.7	32.1	33.6
Once/month	13.1	19.6	17.9
Once/years	8.2	17.3	14.8
December Exam Grade Point Average:			
8 & above	6.7	7.8	7.5
7	15.0	22.9	20.8
6	40.0	37.3	38.1
5	28.3	25.3	26.1
4 or less	10.0	6.6	7.5
Enter Graduate Studies:			
Yes	26.2	25.1	25.4
No	18.0	39.8	34.1
Undecided	55.7	35.1	40.5
Observed χ^2 value (2 d.f.) = 10.99, P. < .01			

usage; namely high "liberalism", high "secularity", low "academic responsibility" and high "vertical mobility". In terms of the original variables, these results point out that these residence drug users are less moralistic, more impersonal and alienated in their view of God, more likely to endorse the "have a good time and get by" attitude towards university education (a motivational syndrome suggesting low academic aspirations), and less likely to come from a family in which the father is semi-skilled and the mother employed. In addition, as shown in the attached table, the following factors were also found relevant: registration in non-science and non-engineering disciplines, low extraversion, low student leadership,

TABLE 3
ATTITUDES TO SEX AND MARRIAGE

	Users (N=61)	Non-Users (N=171)	Total (N=232)
Concept of Marriage:			
Legal contract	21.3	29.6	27.4
Religious bond	36.1	42.6	40.9
Trial marriage	16.4	5.9	8.7
Communal Living	6.6	1.8	3.0
Other	19.7	20.1	20.0
	Observed χ^2 value (4 d.f.) = 10.62, P. < .05		
Should a woman be a virgin when she marries:			
Preferably	31.1	64.7	55.8
Unimportant	57.4	34.7	40.7
Preferably not	11.5	0.6	3.5
	Observed χ^2 value (2 d.f.) = 30.09, P. < .001		
Should a man be a virgin when he marries?			
Preferably	21.3	42.0	36.5
Unimportant	41.0	46.2	44.8
Preferably not	37.7	11.8	18.7
	Observed χ^2 value (2 d.f.) = 21.57, P. < .001		
Engaged (during the past six months) in sexual intercourse:			
Yes	45.0	20.5	26.8
No	55.0	79.5	73.2
	Observed χ^2 value (1 d.f.) = 12.39, P. < .001		

high anxiety, high T.V. watching and free reading, and the attitude that residences are too noisy (Table 3). Thus the necessarily truncated view of the drug user resulting from these findings is that of a relatively more anxious and introverted person.

IV. Conclusion and Implications

The above findings are only suggestive and make possible only limited conclusions. Nevertheless, they point out a very important dimension on which drug users differ sharply from the non drug users, namely, the attitudinal temperamental dimension. One may, in fact, opine that these differences reveal quite distinct paradigms of belief systems of the two groups. If this is so, it would be very relevant to map such paradigms and examine their relationship to behavior patterns. The fact that marijuana usage is predictable from a certain belief system suggests the efficacy of this strategy.

These findings seem to have relevant implications for the Office of Student Affairs in general, and student counselling services in particular, in pointing out that drug-usage may be one way in which more anxious, introverted, and academically less ambitious students respond to the stresses of university life. These offices can then devise steps which should be taken to alleviate some of the stressful conditions.

As pointed out earlier, the original variables used in this study were

TABLE 4
PERSONALITY CHARACTERISTICS

	Males		Females	
	Users	Non-Users	Users	Non-Users
Sober vs. Happy-go-lucky:				
Low	18.5	47.9	14.7	11.2
Average	25.9	17.8	41.2	39.8
High	55.6	34.2	44.1	49.0
	Observed χ^2 value (2 d.f.) = 7.15, P. < .05			
Expedient vs. Conscientious:				
Low	74.1	34.2	52.9	26.5
Average	22.2	38.4	23.5	35.7
High	3.7	27.4	23.5	37.8
	Observed χ^2 value (2 d.f.)=13.73, P. < .001		χ^2 (2 d.f.)=7.93, P. < .02	
Practical vs. Imaginative:				
Low	18.5	32.9	14.7	23.5
Average	40.7	37.0	26.5	39.8
High	40.7	30.1	58.8	36.7
			χ^2 (2 d.f.)=5.05, P. < .10	
Forthright vs. Shrewd:				
Low	55.6	31.5	38.2	36.7
Average	25.9	42.5	50.0	43.9
High	18.5	26.0	11.8	19.4
	Observed χ^2 value (2 d.f.)=4.88, P. < .10			
Undisciplined vs. Controlled:				
Low	66.7	37.0	70.6	46.9
Average	22.2	37.0	26.5	38.8
High	11.1	26.0	2.9	14.3
	Observed χ^2 value (2 d.f.)=7.15, P. < .05		χ^2 (2 d.f.) =6.59, P. < .05	

not selected 'ad hoc'. A study specifically addressed to the putative drug use predictors is warranted before some definite conclusions can be drawn. Moreover, in the present study, different categories of drug users, namely, experimenters and those who use drugs on occasional as well as regular bases, were all combined (since the number of subjects falling in each category was too small for any meaningful analysis) for purposes of analysis. This may have blurred the results, especially those in the area of prediction analysis. Separate analyses of drug-users falling in different categories may lead to sharper and more illuminating findings.

This study was conducted on a typical student population, namely, resident students. Since residences are (or are at least considered to be) less congenial to the use of drugs, the findings of this study cannot be generalized to the total campus student population. A similar study addressed to the general student population is necessary before some definite and more general conclusions can be drawn.

It was not possible to investigate the causal relationship between the use of drugs and belief systems, that is, whether use of drugs inevitably leads to the changing of indoctrinated belief systems about drugs, or

TABLE 5
ANALYSIS OF VARIANCE: DIFFERENCES BETWEEN DRUG-USERS
(MARIJUANA) AND OTHERS (N=521)

Factor	F Value	Probability Level
Liberalism (variables include disavowal of male or female virginity before marriage, and more dating and sex)	32.454	<.005
Secularity (irreligious concept of God, low church attendance)	31.164	<.005
Low academic responsibility (little studying, high proportion of drinking in residence, avowal of the "have a good time" ethic)	19.161	<.005
High "vertical mobility" (mother does not work, father in professional occupation, university level education, high annual income)	12.591	<.005
Not quiet in residence	12.339	<.005
Non-Engineering faculty	9.707	<.005
Non-Science faculty	9.632	<.005
Low extraversion (16 P.F. variables A+, E+, F+, H+, Q ₂ -)	8.783	<.005
Low student leadership (low student government participation, younger age, 1st and 2nd year of studies)	8.721	<.005
High amount of T.V. watching or free reading	6.518	<.025
High anxiety (16 P.F. variables C-, L+, O+, Q ₄ +))	3.390	<.10

liberal belief systems lead to the use of drugs. Our study underscores the need for a systematic investigation in this area.

Note. Section III of this paper is largely based on a study by D. Wardell (Oct., 1971) which has been recently revised and summarized, See, Wardell, D. and Mehra, N. "A note on the prediction of marijuana usage among students in a university residence", Center For Advanced Study in Theoretical Psychology, Advanced Publication Report No. 131A73, The University of Alberta, Edmonton, 1973.

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The Technical Standards of Intellective Tests Used in Alberta Elementary Schools: A Review

Forty-seven Alberta school systems responded to a questionnaire by listing the intellective tests used in their elementary school classrooms. A review of the research literature related to these tests was conducted to compare empirically determined estimates of their reliability and validity with accepted standards. Although most of the tests were found to have the support of acceptable estimates of reliability, there was substantial variability in the adequacy of the reliability of the studies reviewed. Very few adequate investigations of the validity of the tests were found, and in most cases the results were far from conclusive in their support. It was concluded that, until they have the support of thorough and systematic evaluations of utility, the continued use of the tests should be with caution. (Dr. Ogston is an Assistant Professor in the Department of Applied Psychology, O.I.S.E.).

Perhaps no other field has experienced the impact of psychological testing more than has education. Objective tests are more readily available for educational classification, selection, and planning than for the purposes of all other fields combined. In their attempts to determine the effectiveness of curricula and instructional practice, to discover and understand learning difficulties, and to plan instruction and motivate learning, many educators turned to objective tests to assist in making these judgments. Since tests offer educators an efficient and economical method of describing and differentiating pupils, evaluating the effects of educational experiences, and detecting pupils for which specialized instruction is required, it is not surprising that objective testing programs gained almost universal acceptance, or that educators devoted extensive amounts of time and energy to the development of psychometric instruments.

When used intelligently, tests may constitute a powerful force in the improvement of the human condition. But, when poor instruments are employed, or good ones used improperly, the effects upon individuals

and society may be harmful. Concern about the social consequences of educational testing is being expressed more and more frequently. For example, Hoffman (1962) has charged that it has led to the labelling of individuals as to abilities and capabilities, that it has perpetuated a limited conception of ability by observing talents in searching for specific abilities; that it has fostered a 'teach-to-the-tests' mentality in lesson planning; and, that it has contributed to mechanistic decision-making about the future of the testee. Rosenthal and Jacobsen's (1968) now classic investigations of the 'self-fulfilling prophecy' effect in the classroom lends credence to charges of teacher-dependence on objective tests. Because the use of standardized tests can mean so much to so many, particularly the pupils, their use must be subjected to constant scrutiny, not just to ensure that they are properly used, but also to determine if they need be used, and, more fundamentally, if those in use are worthy of use.

Tests are used to assist educators in making decisions about their pupils. Sometimes the test is used to confirm what the educator has surmised about his or her pupils through observation of their classroom performance. Other times the educator seeks to understand a child's performance. Each use has its dangers: an unreliable or invalid test shows an exceptional child to be of average ability, a description compatible with the teacher's observations, or a child's poor performance is clarified by a low IQ derived from an equally unreliable or invalid test. Although the teacher acts in good faith, the test-produced distortion is likely to result in educational consequences which are unfair to the child and the educator, and which pervade the child's subsequent education. Such possibilities emphasize the need for educators to be absolutely certain that the tests used in their classroom, particularly at primary and elementary levels, are the best available. What then are the technical characteristics of standardized tests *in use* which commend their use?

Explicit technical standards for tests used in educational settings have been specified (American Psychological Association, 1966) and are generally accepted. However, for a variety of reasons tests may be in use which do not meet these accepted standards. The purpose of the present report was to evaluate, through a critical review of the relevant literature, the technical characteristics of intellective tests which were in frequent use in Alberta elementary schools. Of particular interest was evidence of reliability and validity arising from research conducted with samples of Alberta children within the past decade. Where necessary, research centered on other populations was reviewed and cited.

Method

Survey

To determine which intellective tests were in frequent use in Alberta elementary schools a questionnaire and covering letter were sent to the "Director, Special Educational Services" of 77 Alberta school districts, divisions and counties listed in the Department of Education's *List of operating schools in Alberta: 1970-1971*. Private schools and consolidation districts were not approached. The letter asked the respondents to list on the questionnaire the "intelligence" and "mental maturity" tests most

frequently administered in their system by grade from kindergarten through grade five, and invited comments on the tests reported in use. The responses were returned by enclosed, return-addressed, stamped envelopes.

Fifty questionnaires were returned for a return rate of 69.94%. Three respondents reported that intellectual tests were no longer administered in their classrooms. Two of the three submitted copies of reports of committees struck to consider the use of standardized tests. Both recommended that standardized testing be *discontinued* at all grade levels within their systems.

TABLE 1
NUMBER OF SCHOOL SYSTEMS REPORTING THE USE OF TESTS

Name and Type of Test	School Grade					
	K	I	II	III	IV	V
Lorge-Thorndike Intelligence Tests	I 3	3	2			
Canadian Lorge-Thorndike		7		12	14	5
Canadian Test of Basic Skills	M		1	10	10	9
Otis Mental Ability Test	I	3	3	9	4	1
Otis-Lennon	1	2	3	4	3	2
Metropolitan Readiness Test	M 8	12	1			
Detroit Beginning 1st Grade Intelligence Test	M 7	6				
Detroit Advanced		2				
SRA Primary Mental Abilities	M	3	3	3		
California Test of Mental Maturity	I 1	2	1	2	1	
Safran Culture Reduced Intelligence Test	I	2	1	1		
IPAT Culture Fair Intelligence Test	I			1		

I - Intelligence M - Mental Maturity

Table I lists all the tests reported in use in rank order according to the frequency of use across the 47 school systems. Also shown is the frequency of use of each test in each school grade from kindergarten through grade five. Of the 12 tests listed in Table I, seven were identified as intelligence tests, and six as tests of mental maturity. Intelligence tests were defined as those which yield intelligence quotients, mental age equivalents, or some deviation score derived from these indices. Mental maturity tests were defined as those which yield an index of testee educational ability or readiness to employ cognitive abilities and skills.

Three tests, the Lorge-Thorndike, Otis, and Detroit, have duplicate representation in Table I. The Canadian Lorge-Thorndike, normed on Canadian samples, is a revision of the original and the Otis-Lennon is a revision of the Otis Quick-Scoring Mental Ability Test. The Detroit Advanced is a graded extension of the Detroit Beginning Intelligence Test.

Procedure

The review was conducted by: (1) searching the professional literature for articles, books, theses, and test manuals which reported investigations of the reliability and validity of each test reported in use; (2) abstracting the reports as to the purpose of the investigation, the sample used, the research design, findings of psychometric utility, and implications; and, (3) determining the correspondence between technical characteristics so identified and accepted technical characteristics. Empirical demonstration of accepted standards was accepted over purported characteristics. *The standards for education and psychological tests and manuals* (American Psychological Association, 1966) provided the criteria against which each test was compared for satisfactory evidence of reliability and validity. Although it was not expected that each test would have the support of all the criteria, the review sought evidence of the following:

1. Estimates of test reliability in terms of stability and internal consistency expressed as:
 - (a) variance of error components, or
 - (b) standard error of measurement, or
 - (c) product moment coefficients.
2. Estimates of stability based upon equivalent forms, including means, variances, and coefficients, or retest, accompanied by a specification of the time period involved.
3. Estimates of consistency based upon Spearman-Brown or Kuder-Richardson formulae.
4. Content validation showing the test to sample the class of situations it is purported to sample.
5. Claims of predictive or concurrent relationships demonstrated by expectancy tables or a correlation relating the test score to a criterion measure (criterion-related validity).
6. Construct validity evidence through demonstration that explanatory concepts or constructs accounted for performance on the test.
7. Discriminative utility evidence through demonstration that the test differentiated between logically related groups.
8. Cross-validation studies supporting basic claims of validity. The tests of intelligence are reviewed separately from the tests of mental maturity to optimize comparisons among tests of each type.

*The Review**Intelligence Tests*

Of the five group intelligence tests represented as being in use, three, the Lorge-Thorndike Intelligence Tests, the Otis Mental Ability Tests, and the California Test of Mental Maturity (CTMM), are well known and in general use. The Lorge-Thorndike was recently revised as the Cognitive Abilities Test, of which there is a Canadian form. The Otis-Lennon Mental Ability Test is the fourth major revision of the Otis. The other two tests reported in use were designed to provide culture—fair estimates of intelligence. The Safran Culture Reduced Intelligence Test (SCRIT) was standardized on Alberta children. The Culture Fair Intelligence Test (CFIT) represents an attempt to sample Spearman's (1927) general ability

factor “g”. Neither test appears to be widely used nor have they been the subject of research.

Reliability. Table 2 summarizes reliability estimates reported for the five intelligence tests, the two forms of the Lorge-Thorndike, and the Otis, each being combined to form one entry. The Lorge-Thorndike has been subjected to the most complete evaluation of reliability with only a stability estimate not reported. All five tests yield acceptable estimates of reliability ranging from moderate to exceptionally high. However, in some instances the estimates reported are inconclusive. Culture fair tests are assumed to be unaffected by experimental and achievement variables and thus retest estimates of reliability simultaneously demonstrate stability and also provide critical construct validation for the robustness of the test. It is unfortunate, therefore, that neither the SCRIT nor the CFIT have retest coefficients reported for them.

TABLE 2
RELIABILITY ESTIMATES

Test	Equivalent Forms	Spearman- Brown	Kuder- Richardson	Test- Retest
Intelligence				
Lorge-Thorndike	.76-.90	.88-.94	.87-.91	
Otis		.85-.93		.87-.94
CTMM		.79		.33-.58
SCRIT			.75-.86	
CFIT		.80		
Achievement or Attainment				
Metropolitan		.85-.94	.85-.95	.89
Detroit		.89-.91	.91	.64-.79
PMA		.84		.84-.94
CTBS (Iowa)		.90		

Conversely, intelligence tests which are assumed to accommodate the acquisition of educational skills may yield spuriously low retest reliability estimates. As a case in point, the retest reliability range of the CTMM shown in Table 2, though significant, is comparatively low. Finley, Thompson and Cognata (1966) calculated retest reliability coefficients for the CTMM-IQ over four years of school (grades 3, 5 and 7). Generally the longer the retest period (four years) the lower the coefficient ($r = .33$). A one year retest period (grades 3 to 4) produced the highest coefficient ($r = .58$). Since tests of this type are not assumed to be free of cultural effects, retest reliability intervals become particularly important. An ideal combination is that shown for the Otis in which consistency and

stability (over the year) estimates are highly comparable (Lefever in Buros, 1959, p. 497-499; Smith, 1970).

An additional consideration in weighing the reliabilities of these tests arises from the finding with the Lorge-Thorndike (Freeman in Buros, 1959, p. 479-481), Otis (Smith, 1970), and SCRIT (Safran, 1963) that reliability estimates tend to increase with the age of the sample upon which it is based. Estimates reported here are for children aged about 5 to 11 years. Presumably children beginning school are as heterogeneous a group as they shall ever be again since there is a wide diversity in the kind and amount of intellectual stimulation they have received. The early educational experience probably acts to equalize experiences and thus stabilize intellectual functioning. Use of group intelligence tests with preschoolers or primary grades should only be with the realization that the reliabilities of these tests are subject to question.

Validity. Since group intelligence tests represent an economical method of measuring the general ability of a group, or of an individual in reference to the group, their use is often predicted upon an assumed relationship between general ability and academic performance. Validation of this assumption requires demonstration that they, (1) are measures of general ability, and (2) are related to performance. Content and construct validation provide a solution to the first problem. If the test can be shown logically to sample intelligence then it may be used with some confidence. However, face validity is the least empirical form of content validity. Factor analytic techniques may be used to identify the content areas sampled by the test. However, in the present cases factor analytic demonstrations of content validity are inappropriate since the tests are purported to yield molar estimates of intelligence rather than estimates of specific skills. Thus it was not surprising to find that reported research on content validation was non-existent. Instead the research emphases were upon construct and criterion-related validity.

Two of the five intelligence tests were found to have construct validation studies reported for them, and the studies were conducted with native Canadian children (MacArthur, 1968). An intelligence test which would not discriminate against Eskimo, Indian or Métis children would be one which has a low relationship with socioeconomic status, little dependence on acquired information, and no relationship with school achievement. Factor analysis revealed that this was true of the SCRIT and CFIT (MacArthur and Elley, 1963). In addition, the two tests obtained high loadings on the primary factor identified as general intellectual ability. The authors concluded that these tests provided the best culture fair estimates of intelligence for grades 1 through 8 among native children. This conclusion may be generalizable to other populations as well in view of the finding that socioeconomic status does attenuate intelligence test results (Anderson, 1962; Barker, Schultz and Hinze, 1961). Indeed, Kittell (1964) reported that the language IQ derived from the CTMM is lower for bilingual children until grade 5 than for unilingual children. Findings of these kinds are particularly relevant to northern Alberta schools where there is a cross-section of racial and economic groups.

As might be expected, the five intelligence tests are interrelated. Interestingly however, the intercorrelations, while for the most part

significant, tend to be moderate in the range of $r = .40-.70$. (Carlson, 1968; Safran, 1963). Certainly correlations of this magnitude provide evidence of concurrent validity, but at the same time suggest that the various tests may very well be sampling quite different abilities. Concurrent correlations with individual intelligence tests were not much more promising. For example, the CTMM total score correlations with the WISC range from 0.43 to 0.77, and 0.43 to 0.56 with the Stanford-Binet (Littell, 1960; Tatham and Dole, 1963; Milholland, in Buros, 1959, p. 314-315). The Lorge-Thorndike has been found to correlate 0.63, 0.54 and 0.71 with the WISC full scale, performance and verbal IQ's respectively and 0.87 with the Stanford-Binet (Freeman, in Buros, 1959, p. 479-481). Finally, Otis correlations with the CTMM have ranged from 0.35 to 0.52 (Burgemeister, Blum and Lorge, 1954). Though demonstrating significant relationships these coefficients are of only moderate magnitude, at most accounting for only about 50 or 60 percent of the measured variance. Clearly, other factors are equally important.

A second index of concurrent ability is based upon the assumption that educational achievement is a function of intelligence; in which case intelligence test scores should be related to measures of academic achievement. At the elementary school level the major academic content areas are reading, arithmetic and language. Using a somewhat small sample of 26 male and 29 female Calgary fourth graders, Frost (1965) correlated SCRIT—measured intelligence with teacher grades and standardized achievement test scores. The correlations between overall teacher grades and the SCRIT were 0.66 for males and 0.62 for females. On the achievement test the correlations were 0.66 and 0.32 for reading and 0.30 and 0.45 for arithmetic. Generally the relationship between the SCRIT and teacher grades was greater than with achievement test scores. Safran (1963) reports SCRIT—grade correlations of 0.52, 0.48, 0.78 and 0.75 for grades 2, 3, 4 and 5 respectively. The general trend seen in these results, increasing validity with successive grades, seems to be the usual case (Ross, 1959).

The Otis has been studied in combination with a representative variety of achievement tests. The resultant correlations have routinely been in the range $r = 0.85$ to 0.93 (Smith, 1970). For example, when correlated with the Iowa Test of Basic Skills for a grade 5 sample only 5% of the nonerror variance was not accounted for by the resultant coefficients (Grotelueschen, 1969). Although these coefficients are impressive indicators of validity, when the Otis is studied with Alberta children the coefficients are substantially smaller. Fritze (1959) found, with a sample of 125 grade 4 and 5 pupils, a correlation range of 0.40 to 0.58 when the Otis Beta was correlated with subscales of the School and College Ability Test and the Sequential Test of Educational Progress.

One use of intelligence test results is the prediction of academic success, although judging from comments offered by respondents to the questionnaire this is becoming an infrequent use. Mattick (1963) compared the utility of readiness and intelligence tests in the prediction of teacher ratings of grade 1 success. The tests were given five months prior to first registration and the teachers' ratings were obtained the following October. The two readiness tests used correlated 0.56 and 0.45 with teacher ratings

while the two intelligence measures, Lorge-Thorndike and CTMM, correlated 0.37 and 0.31 respectively. Mattick concluded that if predictions were of interest then readiness tests are likely to be better predictors than group intelligence tests.

Mattick's study raises an important methodological issue through his use of teacher ratings rather than teacher assigned grades as the criterion variable. Although teacher ratings would seem to be synonymous with grading, the fact remains that the ultimate criterion is the latter. A case in point is Irvine's (1968) finding that although teacher ratings are the best single predictor of final grades, the actual coefficients ranged from 0.59 to 0.90. Obviously teacher ratings are not equivalent to final grades and thus should not be used as the criterion variable.

In a study which did use teacher assigned grades in reading as the criterion, Hopkins and Sitkei (1969) found that a readiness test, in their case reading readiness, consistently correlated higher with the criterion than did the CTMM. When combined with the readiness test to yield a predictive multiple correlation the CTMM only contributed an additional 0.036 percent of the variance. In addition to supporting Mattick's finding and conclusion, these results suggest that prediction within content areas will probably be best achieved using measures which sample the area. This conclusion is echoed throughout this review.

Conclusion: In general the reliability estimates reported for the five intelligence tests are satisfactory, although in some instances the type of estimate found was not the most appropriate. However, the validity studies reported with the tests are far from conclusive. The equivocality of results underlines the need for carefully conducted validity studies. Because intelligence is such a molar construct encompassing so many abilities it is not enough simply to demonstrate that these tests are related to a variety of abilities or achievements. Content and construct validation studies with these tests are a must and yet are seldom conducted. Users of the tests may be confident that the instruments are reliable, but must also caution their use of them with the awareness that they cannot be certain that the tests are sampling what they are purported to sample.

Mental Maturity Tests

Four tests were reported in use which are purported to indicate the present ability of, or the potential learning rate to be expected of, the testee. The Metropolitan Readiness Tests and the Detroit Beginning Intelligence Test were both devised to measure the extent to which school beginners have developed in the skills and abilities that contribute to readiness for first-grade instruction. The SRA Primary Mental Abilities (PMA) samples essentially the same abilities (verbal, reasoning, space and number) but is designed to be given as the child progresses through school. The Canadian Test of Basic Skills (CTBS) is the Canadian revision of the Iowa Test of Basic Skills.

Reliability: Table 2 summarizes the reliabilities reported for the four tests. As might be expected, since maturity is an age-relative concept, internal consistency estimates are emphasized. That mental maturity is a transitory state appears to be demonstrated in the retest column. Retest coefficients reported for the Metropolitan and PMA are based upon two-

week intervals with entering first-graders (Gardner in Buros, 1949, p. 605-606; Burgess, 1961). Powell (1956) reported a retest coefficient of 0.76 for the Detroit over the first four months of first grade and Cronbach (1960) cites a two-year retest coefficient for the Detroit of 0.64. It is not surprising that a measure of maturity which is related to a restricted age group should not maintain its reliability over a number of years, let alone months. Consequently, except when the interval upon which it is based is very short, retest reliability should be weighted much lower than estimates of consistency.

Both Spearman-Brown and Kuder-Richardson estimates for the four tests were within the range $r = .84-.95$, and as such provide acceptable estimates of reliability. The split-half estimate of 0.84 for the PMA is not based upon a total score, but is the average of the reliability estimates for its subscales (Cronbach, 1960). The $r = .90$ cited for the CTBS is in fact a reliability estimate borrowed from the Iowa (Cronbach, 1970).

Although all four tests have acceptable estimates of reliability reported for them, the Metropolitan appears to yield the most consistent estimate regardless of method of computation. More importantly the split-half estimates cited in the manual (0.91, 0.91, 0.94) were obtained from a three group cross-validation (Hildreth, Griffiths and McGauvran, 1965). No other test reviewed in this paper has this support cited for it. An additional feature of the Metropolitan is that it has been the subject of substantially more definitive research than any of the other tests. Finally, having been revised in 1965, the Metropolitan has the most contemporary format and content of the available tests.

Validity: To possess utility, a test should first be shown to possess content or construct validity (Helmstadter, 1964; Cronbach, 1970). These types of validity demonstrate most completely the extent to which the test score represents what it appears to, or is purported to represent. Although criterion-related estimates may indicate concurrent and predictive utility there is always the possibility that the estimates are actuarially-based rather than content based. Thus content or construct validation should be demonstrated as an anchor for criterion-related validity. The most sophisticated method of determining content and construct validity is through factor analysis. When tests, such as the type under discussion, are purported to provide measures of a number of abilities, numerical, spatial and verbal, for example, then it would seem contingent upon users to demonstrate that these scales are relatively pure factors. Similarly, assumptions that the test is sampling a construct like maturity or intelligence requires demonstration that this is indeed the case. Seldom are these requirements realized.

In his review of the PMA, Milholland (in Buros, 1965, p. 1048-1050) reports that although a promising instrument, it simply lacks the necessary validity studies. Cronbach (1960) is adamant about the validity of the PMA in his statement, "Incautious and incorrect claims have been made for the PMA tests" (p. 292). In 1970 he reiterated, "there is little validity research to support profile interpretations" (Cronbach, 1970, p. 376). Although claiming content validity for the Metropolitan, Hildreth et al. (1965) cite as support for this assumption moderate intercorrelation between the

subscales: this certainly supports their claim of a composite readiness measure, but does little to provide evidence of content validity.

The two tests for which content or construct validity studies were found are the Iowa and the Detroit. Finley (1963) found, from a survey of 36 California grades 3 and 5 teachers, that, when compared with other achievement tests the Iowa (CTBS) was preferred for its superior content. Although not a quantified estimate of validity the finding does demonstrate an important facet of content validity, namely user preference. Only one factor analytic study of construct validity was found and is based upon an Alberta sample of 300 boys. MacArthur (1960) reports an analysis which included the CTMM, Progressive Matrices, achievement tests, and the Detroit. The analysis yielded four meaningful factors: (I) intelligence, (II) schooling, (III) verbal, and (IV) numerical. The Detroit was found to load highly on factor I and moderately on factors III and IV. The Detroit would appear to sample the construct "Intelligence" as well as necessary academic abilities.

In contrast to the few studies on instrument validity, the research on criterion-related validity is plentiful, which may have been expected when the tests in question are purported to measure maturity or readiness to handle school work successfully. Consequently, estimates of concurrent and predictive utility are critical validity criteria. In general, the relationship between these tests and school grades, and teacher ratings of performance was moderate. Milholland (in Buros, 1965, p. 1048-1050) reports the median correlation between PMA subscale and school grades to be $r = .59$. Merenda and Jackson (1968) found Iowa subtest correlations with the final grades of 1,078 fourth graders to range from 0.21 to 0.70 ($r = .37$). Although these coefficients are significant, they offer only moderate support for the concurrent validity of the Iowa. In a more definitive study, Finley (1966) had teachers rate their third and fifth grade pupils as below, at, or above the grade level in performance. Using the Iowa to classify pupils at the three levels he found that teacher ratings matched the Iowa classification about three-quarters of the time. In an earlier study, Finley (1963) found concurrent coefficients between the Iowa and other achievement tests to range from 0.65 to 0.87. The Iowa has been the most thoroughly researched instrument in this respect and generally is found to function quite adequately.

The only strict studies of predictive validity found were for the Metropolitan and Detroit. Using teacher ratings and final grades as the criteria the Metropolitan has been shown consistently to predict grade 1 performance. Administered in April, prior to first registration, the Metropolitan was found to correlate 0.56 (Mattick, 1963) and 0.53 (Zingle and Hohol, 1964) with first grade performance. The latter study like the following, was based upon an Alberta sample. Romaniuk, (1964) studied the utility of the Metropolitan in the prediction of first grade readiness for underaged children in Jasper Place. He found that the test misclassified children as either false positive or false negative in a mere 13.5 percent of the cases as compared to 19 percent by chance. While an important demonstration of the utility of the test, it is this very kind of research which desperately needs the conclusive support of cross-validation.

As is too often the case in estimating predictive validity, the criterion variable is test-measured achievement rather than the eventual criterion, teacher assigned grades or promotion statements. Flathman (1966) reported Detroit prediction coefficients of 0.48 for reading skills and 0.59 for arithmetic, based upon Alberta grade 1 pupils. Hamaluk (1967) found a correlation of 0.65 between the Detroit and the Gates Primary Reading test with the same population. In a study that may reflect upon the use of these tests with Alberta's native population, Mishra and Hart (1970) found a fall-to-spring predictive correlation range of 0.49 to 0.53 between the Metropolitan and the related Metropolitan Achievement Tests with third grade Mexican-American children. This range is substantially lower than that reported by Hildreth et al. (1965) in the Metropolitan's manual. Although the subject of much research in relation to intelligence tests, little is known about cultural effects on mental maturity scales.

Conclusions: In all respects the Metropolitan has been the best researched of the four tests. Estimates of reliability and validity for the test are consistent and tend to be somewhat higher than those cited for the other tests. A shortcoming of each test is its relatively low validity estimates, a finding that should be of some concern to educators. Each of the tests was designed to sample characteristics presumed to contribute to success in school work. While they appear to sample these characteristics other variables appear to be of equal, if not greater importance. For example, Chronister (1964) found that, in a multiple-correlation of seventeen personality, behavioral and intelligence variables with the Iowa, intelligence alone accounted for 90 percent of the variance. The relationship is so high that "intelligence" and "mental maturity" or "readiness" could very well be interchangeable constructs. As with intelligence tests, one must wonder whether the concept of "mental maturity" is not a too molar concept which is over-encompassing. As an alternative, educators might consider more emphasis on maturity or readiness for specific skills like reading or arithmetic. In any event, if these tests are to have utility it should not be as classification devices. Rather, they would be best used as academic monitors to point out possible pupil weaknesses to the teacher.

Discussion

In general, the tests reported in most frequent use are the tests which were found to be among the better substantiated by reliability and validity studies. Fortunately those tests which are the least appropriate for use with children, or are not supported for use by the literature, are not in general use. However, a few of the more frequently used tests are not well researched and thus should be used with extreme caution. Although users appear to have selected their tests well, one can only speculate on the uses to which the tests are put. On the other hand, users must be disappointed by the generally low quality of research they may consult when evaluating a potential test. Too often the studies reported have been conducted with inordinately small numbers, or with samples of unrepresentative children. A user must wonder how studies of these types relate to the population with which he intends using the test. Too few good reliability or validity studies are reported in the literature. Instead, there

is a proliferation of studies which ask questions which are peripheral to a user's major considerations. It is as if the researchers are accepting the claims of reliability and validity made for the instrument without considering the special characteristics of their samples. Consequently, the tests are being employed in exquisite designs and yielding marvelous results even though prior demonstration of fundamental utility is not well established. A potential user who followed A.P.A. standards in selecting tests would find, as did this review, that claims are apparently made tongue-in-cheek, on the basis of clearly ambiguous results or on the basis of no data at all!

A finding with many tests was that reliability and validity estimates were a function of age, generally increasing with age. The implications of such findings demand the utmost caution and consideration when test results may have a pervasive influence on subsequent education. Although it is unlikely that drastic decisions would be made on the basis of the results of *one* test, there is always the possibility that a combination of errors will accumulate, leading to the victimization of a child.

Recognizing that so many variables can attenuate reliability and validity, it is surprising that so few cross-validation studies are performed. Although replication of studies would provide comparable findings, replications are generally not being made, and in the few instances where they were found, the differences in methodology were more than enough to discourage confidence in the results. Cross-validation procedure can produce what replication cannot, namely a standardized method and thus results comparable in the strictest statistical sense.

Psychological tests are recognized as attempts to sample the actual domain of an individual's beliefs, behaviors, skills, abilities and so forth. As such, they are necessarily simply estimates of the way the individual is, they are not exact replicas. Given that this is so, then it would seem only reasonable that every attempt be made to investigate the relationship between these representative estimates and reality. It was disappointing therefore, to find that so many concurrent and predictive validity studies use as criteria, not the realities of the testee's life, but other representative estimates of reality. It may be reassuring to know that two tests of ability are related, but at some point these two tests must be shown to be related to a non-standardized reality. Perhaps no other circumstance can provide such a rich collection of behaviors, skills, achievements or abilities than the classroom education of the individual. It is high time that these tests were shown to relate to the actual processes of education rather than to other best estimates.

The availability of tests places the educator in a dilemma. He wants objective, unbiased knowledge of his pupils' abilities and so forth, and so he either turns to available tests or constructs his own. But what happens when the test fails to agree with what he observes? Does he reject his impressions as being subjective and biased, or does he reject the tests' results as being inaccurate and invalid? Unfortunately, the dilemma is unsolvable unless you happen to be that educator. As long as tests are used in education systems, the dilemma will occur repeatedly. One can only hope that it continues to recur, for if it does not, either the tests are super-

flous, or else the teacher is being guided by blind faith. If it does, then let everyone hope for the child's sake that the teacher knows his tests.

The review was conducted while the author was a Canada Council Doctoral Fellow in the Department of Psychology, The University of Calgary.

N.B. For details of tests not referenced, the reader should consult Buros.

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Psychological Orientation of Soviet Teachers

Teachers in the USSR, just as in North America, take courses in psychology, read psychological articles, hear lectures on psychology at their professional meetings, and participate in psychological discussions concerning pupil behavior and the process of teaching. But the theoretical orientation of the psychology they learn, in contrast to that studied by North American teachers, is not within the tradition of James, Thorndike, Koehler, Watson, Freud, or Piaget. Some of the leading names in their psychology are Vygotsky, Pavlov, Makarenko, Uznadze, Luria, Zaporozhets, and Kostiuk. These scholars, some of whom are widely known in the west, are rarely referred to in popular North American texts on educational psychology. The teachers of the USSR have a distinctive, and probably unique, tradition in psychology and their attitudes to educational issues and practices reflect the orientation of this tradition. Some of these orientations are identified and discussed in this paper. (Dr. Gulutsan is Associate Professor in the Department of Educational Psychology, The University of Alberta.)

The psychological background of the Soviet teacher's orientation which contrasts most with that found in the West can be summarized as follows:

1. The influence of Vygotsky and his students, especially Galperin and Luria, on the conceptions of learning, mental development, and the formation of mental actions;
2. The physiological basis of mental activity, regarded as "reflection"; and
3. The role of the collective in socialization and character development.

The reader is forewarned that similarities exist between the orientation of teachers in both East and West: it should not be concluded that Soviet teachers represent a unique species of man. But it must also be said that Western viewpoints on Soviet psychology and its bearing on education, can be grossly misinformed. One illustration of this is the statement by Stout (1967, 27-8):

Philosophically, the Soviets are bound to certain axiological and epistemological biases, which in essence reflect the belief that certain individuals are possessed of intellect which is educable and others with certain abilities and capacities

which are trainable. The influence of Pavlovian psychology with its stimulus-response emphasis is in clear evidence throughout the operation of the system, which is directed toward the notion that man is nothing more than a highly trained animal whose behavior can be largely determined. It appears that the answer to the question of whether or not man is the sum total of all his parts or something else is still to be determined by the Soviets.

On the other hand the words of Makarenko have a familiar ring, "Obviously we need talented and sensitive people (as teachers) with desirable character attributes. To select the outstanding ones remains a difficult task, although many people still believe that anyone can bring up children" (Makarenko, 1964, 159). Other common features can be readily found.

Vygotsky on the Relation of Learning to Development

Vygotsky's conviction that the essential mark of learning is that it precedes development and creates the zone of potential development (Simon and Simon, 1963, p. 30) has had a profound influence on Soviet education and psychology. Development depends on training. "Teaching", Vygotsky wrote, "which is oriented to an already accomplished stage of development is ineffective from the point of view of the child's general development, for it does not lead the process of development but lags behind this process. The only good teaching is that which outpaces (outdistances) development" (1963, p. 31).

Vygotsky rejects three views on the relation of learning to development which have deep roots and long traditions in Western psychology. First, he rejects the position he sees implied in Piaget's thinking. He says:

The process of development is completely independent from the process of learning, that even a separation of these processes in time is postulated. Development must reach a certain stage, certain functions must mature, before the school can embark upon teaching certain knowledge and habits to the child. The course of development always precedes the course of learning. Learning lags behind development, development always goes before learning. This approach makes it impossible even to pose the problem of the role played in development by learning and by the maturing of those functions which are activated in the course of learning (1963, p. 22).

The critics of the conceptions that teaching should be postponed until the child is "ready" and that one should teach with an orientation towards the average had strong theoretical support from Vygotsky. Because of the translation lag, many Western authorities have not been aware of his contributions. They would have been heartened by an educational theory characterized by the absence of the postponement concept and of the notion of teaching to the average. Vygotsky's view that teaching must be actively directed at the learning which takes place in the zone of potential development would have given them aid and comfort.

The second view which Vygotsky finds unacceptable has a long tradition in North America and is associated with the functionalist positions of William James, Thorndike, and others. It is still very much alive in contemporary American educational theory. Here the focus is reversed and learning no longer follows development, learning *is* development. Vygotsky (1963, p. 22) writes as follows:

At first glance this standpoint may seem more progressive than the preceding one, which is fundamentally based on complete separation of the processes of

learning and development, in that it gives to learning the central significance in child development. But a closer examination . . . indicates that, for all the apparent contradictions, the two standpoints . . . learning is independent of development and learning is development agree on basic points and are, in fact, very similar to each other.

Vygotsky's interpretation of James' position and its relation to education reads as follows:

Education, says James, may be best defined as the organization of acquired habits. Development is also in effect reduced to the accumulation of reactions. Every acquired reaction, says James, is usually either a more complex form of the innate reaction which a given object initially tended to evoke, or a substitute for it. James affirms this proposition as a general principle which underlies all processes of acquisition, i.e. development, and directs all the teacher's activity. For him the individual is simply a living complex of habits.

It is difficult to clarify this concept except by saying that . . . laws of development [are regarded] as natural laws which teaching must take into account, just as technology must take into account the laws of physics; teaching can do no more to change these laws than technology can change anything in the general laws of nature.

The theory sees the processes [of learning and maturation] as accomplished proportionally and in parallel so that each stage in learning corresponds to a stage in development. . . . The further question as to which process precedes, which follows after, is, of course, pointless (p. 23).

The third view, which Vygotsky finds unacceptable, comes from structural or Gestalt psychology. In Gestalt psychology the relation of learning to development remains unclear and contradictory because learning and development seem to be accepted both as coincidental and not coincidental. Development is taken as the result of both maturation and learning. Maturation makes learning possible; in turn, learning may stimulate or advance maturation. But learning necessarily plays a secondary role and is wholly dependent on maturation.

Vygotsky rejects, as has been seen, the view on learning and development advanced by Piaget, James, Thorndike, and the Gestaltists as inadequate for explaining learning in the child. Vygotsky formulated his basic law of development as follows:

All higher (human) functions make their appearance in the course of child development twice; first, in collective activity, social activity, i.e. as interpsychic activity; second, in individual activity, as internal properties of the child's thinking, i.e. intrapsychic functions (1963, p. 26).

In brief, the development of the higher mental functions such as thinking, will and moral feelings arise from the child's interaction with the people around him. First, the social and external, then, the personal and internal, and finally, activity which is wholly dependent on the interiorized (learned) mental actions.

During the teaching act the teacher orients himself to the zone of potential development. This is the area which lies between the tasks the child can do with guidance and the tasks he can do independently. Vygotsky illustrates the concept by reference to the Binet-type tests. Because they rely on discovering what the child can do independently, such tests determine only the actual level of the child's development.

We have before us two children with mental age of seven, but one [Vygotsky points out] with a little help can do tests up to nine years, the other only to

seven and a half. Is the mental development of these two children equivalent? Their independent activity is equivalent, but from the point of view of future potentiality for development, the children differ radically (1963, p. 30).

[Vygotsky concludes] the state of the child's mental development can, therefore, only be determined by finding out at least two levels—the level of actual development and the zone of potential development. This fact which of itself may seem of little significance, is in reality of decisive importance and brings into question all the theories about the relation between the processes of learning and development in the child. In particular, it alters the traditional view as to what should be the pedagogical approach when development has been diagnosed. Hitherto, the matter has been presented as follows: We try, with the help of tests, to determine the level of the child's mental development and this the educator must regard as the limit which the child cannot transcend. This very way of presenting the question involves the idea that teaching must be oriented to the yesterday of the child's development (1963, p. 30).

Vygotsky's basic notion that teaching must *outpace* rather than follow development was written in 1934, the year he died at age 38. It remains as one of the central pedagogical and psychological concepts taught to teachers and teachers-in-training in the Soviet Union (Krutetsky, 1971, p. 90).

Is it true to say that Vygotsky's influence has made a difference to the way the teacher works with the children in the classroom? My impressions, based on observations during visits to Soviet schools and on discussions with teachers, lead me to believe that there is a difference. The teachers attempt to direct their activities towards having each child become more perceptive of the world he lives in and more conscious of his relations to this world. They attempt to have each child develop modes of thinking which increase his ability to reflect reality. The goal appears to be the all-round development of each individual child. The teachers expect that their work will influence the development of the child's mind and, with this, his psychic life and personality. This atmosphere of individual concern within a setting of the organized collective, characterized the classrooms I visited, even though the physical arrangements were the kind that we in North America would consider traditional and inadequate.

Galperin on the Interiorisation of Actions

Galperin, a student of Vygotsky's, proposed a teaching model for interiorizing mental actions which Soviet psychologists and educators regard as efficient (Smirnov, 1966; Galperin, 1966). Mental actions, the psychic or internal analogues of objective actions, are formed by stages which strictly follow each other according to the following paradigm: (i) orienting basis of action; (ii) external action; (iii) action in external speech; (iv) performing action in external speech to oneself; (v) action in inner speech (thought); (vi) subsequent performing of action or exteriorization.

Two features are prominent in Galperin's paradigm. The external, i.e. the social, is primary and the inner intellectual and personality functions have their origins in that which is external to the child. Galperin says, man's entire mental make-up is set from outside, all its structures must be learned (1966, p. 55). The external becomes internal by a process of assimilation or appropriation. In this process speech plays the major role.

Galperin (1968) sought to apply his theory of stage-by-stage develop-

ment of mental actions to the teaching of arithmetic, writing, and grammar. For him, the ultimate stage is the *orienting basis* for arriving logically and rationally, rather than empirically, at the development of mental actions. For this type of higher level mental development, the child must acquire a generalized method of analysis which bears on the "basic units" of the material of the learning in question as well as the general rules of their combination in concrete phenomena. For arithmetic, this means that, in the initial stages, the child must be introduced to measurement (getting at the basic units) before learning to count (i.e. the rules of their combination).

Luria on the Role of Speech in the Regulation of Behavior

A study by Luria (1963) will serve to illustrate the Soviet theory of the role of speech in the development and regulation of behavior. The three functions of speech—generalizing, source of thought, and regulating behavior—develop as follows:

At a very early age the child begins to master speech addressed to him; at first the general tone of this, then separate words and finally the content of complex combinations, the information which the adult addresses to him. At early stages of development information is perceived only in cases when the adult's speech is included in a situation witnessed by the child. If any child of up to a year old is addressed in an unusual tone, in any unusual situation, or if there are no concrete actions accompanying speech, then the content of speech remains beyond the child's understanding. Only in the third year does the child begin to perceive relatively complex sentence constructions.

The child's ability to use the verbal instructions of adults develops in a similar way. By the end of the first year, the child is in a position to fulfil simple commands; but he only fulfils them if the command is given in a reasonable (and adequately feeling) tone and in a causal situation. A command given in an unusual tone, or addressed to the child in an unusual situation, is not fulfilled. If, for instance, a child who has just reached the age of two is asked to take a doll, at a moment when he is on his way to pick up another toy, he is unable to fulfil the adult's verbal instructions and, reaching out towards the doll, picks up the other toy on his way. If a child of this age who is putting rings on a stick is asked to take off a ring, the adult's verbal instructions, coming up against an already prepared action, are not sufficiently strong to overcome it, and the child, hearing this command, continues intensively to carry out the action begun.

... Only considerably later, at the age of three to three and a half years, does perception of adult speech and performance of the tasks formulated verbally reach a stage of development at which speech in fact determines the child's further activity independently of the conditions in which it is addressed (1963, 85-86).

In tracing the development of a simple general rule such as pressing a button when the red light flashes and refraining from pressing when the green light flashes, Luria demonstrates the importance of speech in all stages of child development from the time when the child is first conditioned, with the help of speech, to press, then not to press, and then to press on red, and not to press on green. This conditioning takes several years. If the child is to generalize, to engage in thinking, and to regulate or control his own actions, he must do so with actions which have become internalized by means of speech.

School learning is based on the speech and thought patterns and actions which the child has acquired in his pre-school years. School learning,

through language, helps the child appropriate more and more of the world which surrounds him into his consciousness. This internalization is central for the formation of abilities because the child can do, create, express, or otherwise make external only that which is within him. Education moulds man's inner resources through speech. As a result, it is to be expected that Soviet teachers place much stress on speech in mental development.

In the schools, teachers at the secondary school level present a verbal description of the skill to be learned before placing tools and other working materials in the pupil's hands. Then the pupils are asked to verbalize and be as conscious as possible of the skill, for example, in terms of the sequence of manual actions. Learning is thought to be more effective when verbal analysis precedes the learning of a skill than where verbal analysis runs alongside the learning of the skill.

Physiologists on the Mind, Consciousness, Learning

The unifying concept in Soviet psychological theory is Lenin's theory of 'mental reflection'. Soviet teachers direct their activities so as to make individual children more conscious, more aware of the surroundings in which they live. In helping to develop the minds of children, the teachers believe that their prime task is in the area of the higher mental functions which lead to a more accurate reflection of reality by the individual pupil. Lenin (1970, p. 177) has said: "The mastery of nature manifested in human practice is a result of an objectively correct reflection within the human head of the phenomena and processes of nature, and is proof of the fact that this reflection (within the limits of what is revealed by practice) is objective, absolute, eternal truth."

The mechanisms which form the basis of reflective activity have been investigated by Soviet physiologists, to a lesser extent by psychologists. Their importance for psychology is illustrated in the following two quotations:

The specific tasks of psychology begin in connection with the transition to the study of man's mental activity performed by the brain. Psychology studying mental activity is one of the sciences about man. It is the science which reveals the laws governing man's mental activity performed by the brain (Rubinstein, 1966, p. 51).

For scientific psychology the point of departure for studying the nature and development of the mind is the proposition that the mental is a reflection and that it emerged in the process of development of the organic world as a property of highly organized matter (Shorokhova, 1966, p. 201).

The contributions of the physiologist, I. P. Pavlov, on conditioned reflexes, the second signal system (verbal behavior), and the orienting reactions are basic to the theory of mental reflection. The more recent Soviet research in this area is directed at complex patterns of behavior, and on such features as wholeness, goal-directedness, self-regulation, programming and prediction of actions (Smirnov, 1966, p. 20). Pavlov's view, man as a self-regulating system, has been summarized by McLeish (1963, pp. 185-190). These physiological findings form a chapter or two in the educational psychology texts used for training teachers and new developments are reported in regular educational journals (e.g. Liublinskaya, 1971; Kostiuk, 1968). Soviet teachers are introduced to the physiology of

mental activity early in their training. Parenthetically, the popular magazines, such as the *Home and School Journal* (Semya i Shkola), bring this knowledge to the attention of a wider public.

Teachers adapt their teaching procedures according to their understanding of the way the brain orients the organism to the environment. It is a matter of how the brain forms conditioned reactions, including speech and thinking, and stores and uses these for an adequate reflection of reality.

Makarenko on the Collective in Personality Formation

Soviet approaches to character education owe much to the thought of Anton Semyonovich Makarenko. Scarcely a week passes without some mention of Makarenko in the educational press of Soviet Union. Translations of, and commentaries on, Makarenko's work continue to indicate his popularity. Schools bear his name. Merit teachers wear the Makarenko medal.

For Makarenko (1949, 1953, 1959), education is by the collective, through the collective and for the collective. This is so because the collective is the basic unit of organization in Soviet society. Makarenko's basic thesis has been summarized by Bronfenbrenner:

Optimal personality development can occur only through productive activity in a social collective. The first collective is the family, but this must be supplemented early in life by other collectives specially organized in schools, neighborhoods, and other community settings. The primary function of the collective is to develop socialist morality. This aim is accomplished through an explicit regimen of activity mediated by group criticism, self-criticism, and group-oriented punishments and rewards.

Bronfenbrenner (1962, p. 555) is probably the most prominent American authority on the collective in socialization. He identifies the seven principles of communist methods of character education which present the greatest contrast to patterns employed in the West:

1. The peer collective (under adult leadership) rivals and early surpasses the family as the principal agent of socialization.
2. Competition between groups is utilized as the principal mechanism for motivating achievement.
3. The behavior of the individual is evaluated primarily in terms of its relevance to the goals and achievements of the collective.
4. Rewards and punishments are frequently given on a group basis; that is to say, the entire group benefits or suffers as a consequence of the conduct of individual members.
5. As soon as possible, the tasks of evaluating the behavior of individuals and of dispensing rewards and sanctions is delegated to the members of the collective.
6. The principal methods of social control are public recognition and public criticism, with explicit training and practice being given in these activities. Specifically, each member of the collective is encouraged to observe deviant behavior by his fellows and is given opportunity to report his observations to the group. Reporting on one's peers is esteemed and rewarded as a civic duty.
7. Group criticism becomes the vehicle for training in self-criticism. It is regarded as a powerful mechanism for maintaining and enhancing commitment to approved standards of behavior, as well as the method of choice for bringing deviants back into line.

Helen Redl (1964, p. 142) has summarized the Soviet system of upbringing created by Makarenko in these six important characteristics:

1. *Demands*—He advocated a combination of most exacting demands upon the youngster with utmost respect for his individuality.
2. *Discipline*—He proposed that children require the discipline of combating and surmounting difficulties.
3. *Character Building*—Makarenko felt that the first two elements plan an important role in the character building process.
4. *Family Role in Upbringing*—He stressed the importance of correct family upbringing and gave many instructions to parents (lectures on child education).
5. *Collective*—He was the first one to elaborate in detail the educational significance of the collective.
6. *Perspectives*—Makarenko said, "Man must have something joyful ahead of him to live for . . . this joy has to be organized, brought to life, and converted into a possibility. Primitive sources of satisfaction must be steadily converted into more complex and humanly significant joys. . . ."

Bronfenbrenner (1966) carried out an interesting cross-cultural experiment in which he compared the responses of Soviet and American school children to pressures from adults. He reasoned that Soviet school children, because of the role played by the peer collective in Soviet methods of upbringing, would be less likely than their American age-mates to experience peer pressure as conflicting with adult values. Hence, they could identify more strongly with adult standards of behavior and be more responsive to adult influences. He asked school children in both countries to respond to a series of conflict situations under three experimental conditions: a neutral condition in which the child's reaction would be known only to himself and the experimenter, an adult condition in which responses would be revealed to parents and teachers, and a peer condition in which everyone's answers would be shown to the entire class but not to adults. The principal results of the experiment were as follows: American youngsters revealed a much greater readiness to engage in peer-instigated anti-social behavior than did their Soviet counterparts. Although children from both countries showed equal reaction to pressure in claiming more socially approved behavior under the adult condition than under the peer condition, Soviet youngsters were more responsive to adults, whereas the Americans were more influenced by their peers. Moreover peer pressure operated in opposite directions in the two societies, increasing adult-approval responses in the USSR and antisocial reactions in the United States. With respect to problems of education, Bronfenbrenner points out, the findings emphasize the importance of utilizing the power of the peer group to constructive ends to influence the behavior and personality development of the child.

Educational Psychology Texts

A main source of data on the psychological orientation of teachers are the texts designed for introductory courses in educational psychology. The table provides an analysis of the contents of three texts in educational psychology from the USSR, the USA and Britain. The following observations may be of interest in that they point to features emphasized in Soviet texts.

TABLE 1

APPROXIMATE COVERAGE OF SELECTED TOPICS IN A RUSSIAN, A BRITISH AND AN AMERICAN INTRODUCTORY TEXT IN EDUCATIONAL PSYCHOLOGY

	Russian (Levitov) 297 1/4 Pages %	American (MacDonald) 620 3/4 Pages %	British (Stone) 367 1/2 Pages %
Educational Psychology (General)	8.5	14.5	14.5
History	3.7	0.1	-
Statistics, Design, Methodology	0.3	1.9	0.8
Developmental	3.8	4.9	4.9
Neural and Physiological Correlates of Behavior	3.0	-	3.5
Heredity and Environment	-	0.8	5.6
Abilities, Aptitudes, Retardation, Intelligence	-	2.9	11.9
Typology and Individual Differences	4.8	1.5	0.4
Attitudes and Social Psychology	7.4	18.1	6.0
Motivation and Emotion	2.5	3.1	8.3
Volition and Moral Behavior	6.2	-	-
Personality and Interests	10.0	3.6	-
Attention and Set	2.5	1.3	1.2
Concept Formation and Thinking, Problem Solving	5.1	6.4	13.2
Conditioning and Learning	7.1	16.8	16.4
Creativity and Aesthetics	10.5	1.3	-
Habits and Skills	7.7	2.3	0.5
Memory	1.8	2.2	-
Perception and Sensation	3.4	2.1	1.6
Simulation and Modelling	-	2.9	-
Verbal Behavior	1.7	0.4	4.6
Vocational Development	3.3	-	-
Evaluation	-	10.0	6.0
Teacher's Role	6.7	2.9	0.7
	100.0	100.0	100.0

The Russian text gives considerable attention to personality, interests, aesthetics, volition, moral behavior, individual differences, and the role of the teacher. Matters relating to intelligence, evaluation, and statistics receive little or no coverage as is true of the heredity-environment issue. The American and British texts devote more space to learning and conditioning, the area considerably influenced by Pavlov's physiological studies of the higher nervous functions. Social psychology receives more attention in the British text.

Concluding Remarks

Only a small segment of Soviet educational psychological thinking has been selected to give some perspective, or feeling, for the psychological orientation of Soviet teachers. The literature on personality formation, moral development, individual differences, temperament, defectology, the psychology of school subjects has not been touched upon. But the trends described above are characteristic of these other areas.

Soviet writers regard their theories and methods as more progressive and more optimistic in relation to the role of the school than those found in bourgeois or capitalist countries. The theories of educational psychologists reveal extensive possibilities for training children and improving education. The real masters of pedagogics according to Kuzmina (1963) know that everything serves the main purpose, the formation of personality. For this, psychological science provides the rationale (p. 101).

Among the teaching abilities that teachers are expected to develop, we find one called *pedagogical imagination*. Kuzmina describes this as "the ability to imagine the ideal personality, the model after which the teacher wishes to shape his pupil by means of developing his natural tendencies and capacities, moulding his personality, his habits, his behavior, his future activity, his happiness; in fact, raising him to the level of a highly developed personality, with a wide range of interests. At every stage of his educational activity the teacher achieves but partial results. His imagination helps him to continue to keep in mind the final purpose. It helps to see the future nature of his pupils, to foresee the development of individual pupils and groups of children, and to arrange his educational work in such a way as to promote the positive features of a personality and to inhibit the children's negative tendencies, thus planning for the most remote future of the children. It is imagination that helps the teacher to see the teaching matter as well as his educational measures from the children's point of view and thus he is able to improve the educational process accordingly (1963, p. 96).

One may observe, in conclusion, that the psychological orientation of teachers is consciously fostered in the USSR. A coherent psychological rationale, along lines which are optimistic, broad, stimulating and coherent with dialectical materialism, supports this orientation.

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An Analysis of the Applicability of the Locus of Control Construct

The usefulness of Rotter's "locus of control" construct in suggesting hypotheses was called in question in a previous study by Janzen, Beeken, and Hritzuk. This paper clarifies the problems raised in the earlier paper, and analyzes certain other generalizations that have been made about this variable. The positive evaluation of the concept of internality is questioned. The I-E scale, used to measure locus of control, is examined. A potentially productive area of research and application—learning theory—is pointed out. (Dr. H. L. Janzen is Assistant Professor in the Department of Educational Psychology, The University of Alberta; Don Beeken is a graduate student in the same department).

In a previous study by Janzen, Beeken and Hritzuk (The Alberta Journal of Educational Research—March, 1973) various dimensions of teacher attitude were examined in relation to the Internal-External Locus of Control scale developed by Julian B. Rotter (1966). The I-E scale, as it is termed, is an attempt to measure the extent to which a person believes that reinforcements are contingent upon his own behavior (such a belief is termed "internal" locus of control), as opposed to a belief that reinforcements are the results of luck, or chance, or powerful outside forces, or unpredictable events ("external" locus of control). Janzen *et al.* (1973) were concerned with the relationship of this personality variable to teacher attitudes such as classroom order, integrative learning, consideration of student viewpoint, subject matter emphasis, emotional disengagement, and student autonomy.

The purpose of this paper is to examine the value of the locus of control construct as a predictor of attitudes such as those mentioned above, and in general, as a useful predictor of other personality variables. In particular, this article will examine the role of locus of control in interpersonal

relations, and of activity (social or otherwise) as opposed to complacency. These two concerns arose out of the results of our previous study. We will also discuss certain problems which seem to be persistent in the expectancies of an internal or external control ideology, and we will offer a suggestion as to why such problems have arisen. It is hoped that such a discussion will provide useful insight into the generation of further hypotheses and especially into the explanation of subsequent results.

One important hypothesis of Janzen *et al.* (1973) regarded the relationship of locus of control to the degree to which a teacher endorsed student autonomy. It was expected that greater belief in student autonomy would correlate with an "internal" locus of control. This expectation resulted from a characterization of the "internal" individual as one who is more skill-oriented and capable, who holds himself responsible, and who tends to see others in the same light in which he sees himself (Rotter, 1966). The same expectation is reinforced by further characterizations of the internal as less dogmatic (Clouser & Hjelle, 1970), less neurotic (Platt, Pomeranz, Eisenman, 1970), less anxious (Hountras & Scharf, 1970), less blaming (Phares, Wilson & Klyver, 1971), more likely to attribute success to ability than to motivation (Bartel, 1970), and more tolerant (Hersh & Schiebe, 1967). Central to this hypothesis was the suggestion that the "internal" would be more likely to give to others the freedom of individual action that he perceives himself as enjoying. He should see others as also "internal" and this perception should be accompanied by a desire to treat them in the same manner in which he himself expects to be treated. Since the "internal" is resistant to coercion (Lewis & Blanchard, 1971) he is expected to be less coercive of others, that is, less controlling. In the case of the teacher-student relationship he should therefore allow greater student autonomy.

The hypothesis that the "internal" will endorse student autonomy was rejected. In fact, the correlation was in a direction exactly opposite to that expected. The "external" teacher endorsed student autonomy, the "internal" did not ($r = 0.30$; $p = 0.05$). The explanation of this result leads to reconsideration of the proposition that the "internal" is actually more willing and capable than the external of seeing others as he sees himself or of granting them autonomy. There seem to be some impediments to his taking this perspective.

We cannot overlook the "controlling" qualities possessed by the "internal". He believes that self-originated activity is useful and possible and he is likely to exert attempts to control his environment. He is self-controlling and concerned with failure (Rotter, 1966). He is resistant to coercion (Lewis & Blanchard, 1971) and he is dominant. He sees himself as assertive, achieving, independent, and powerful (Hersch & Schiebe, 1967). These characteristics would seem to promote an outlook upon others as being part of an environment in which the internal sees himself as responsible and powerful. Why should we expect his controlling attitude to reverse itself in the special case of inter-personal relations? The movement toward seeing others as autonomous is in no way encouraged by the controlling tendencies mentioned above.

It seems logical that the qualities commonly associated with the

“external” would be much more likely to promote the autonomy of others. He is less worried over matters of personal control, failure, and coercion. These characteristics would permit a less power-oriented perspective which would be manifested in a less controlling outlook towards other persons—such as students. The results of our previous study would seem to support this view.

It has been suggested that the external outlook forms a type of defense mechanism against failure (Rotter, 1966; Rotter, 1971). Ostensibly the external can refuse to take failure personally and thereby avoid its trauma. Whether or not this is true, it should be noted that this type of defense is quite different from “defense by control” as exhibited by the internal.

That “internals” may in fact be more defensive is supported by Lipp, Kolstoe, James & Randall (1968) who found that “internals” who were physically disabled had significantly higher recognition thresholds than their “external” counterparts when presented with pictures of handicapped persons. They seemed to be more denying of their own situation. This distortion of objective reality was also demonstrated by Lewis and Blanchard (1971) who found that “externals” more correctly perceived their quality of choice in an experimental situation than did “internals”. This tendency toward defensiveness seems to be part of a general propensity for the “internal” to strive strongly to retain control regardless of his situation. Such a defensive reaction might not always be appropriate, and on the part of an “internal” teacher, would count against his ability or willingness to encourage student autonomy at the expense of his own control.

The correlation (in the teacher sample) of external locus of control with endorsement of student autonomy can be explained in the manner just stated. But it seems that an opposing explanation of the same correlation must be anticipated and dealt with. The opposing argument is typical, and runs something like this: the “external” teacher is pessimistic about personal power, and fearful of responsibility. He is apathetic to life, action, other people in general, and his class in particular. From this outlook, students gain autonomy. In the opinion of the present authors, such a view is intolerable. Our reasons for rejecting it follow.

It is unfortunately common in research concerning locus of control, that implicit assumptions of the negative nature of externality and the positive nature of internality, contribute a great deal to generation of the hypotheses and explanation of results. One of the most seriously damaging of these implicit assumptions concerns a predilection to activity of the “internal” as opposed to passive, apathetic tendencies of the “external”. Very little research supports this conjecture.

A study by Seaman & Evans (1962) of tuberculosis patients found that “internals” asked more about their condition and were less satisfied with the answers than “externals”. Seaman (1963) also found that reformatory inmates remembered more about operation of the facility, parole, and long range economic facts related to their eventual freedom, if they were internal than if they were external.

Strickland (1965), Phares (1965), and Gore *et al.* (1963) found some evidence that social action is correlated with internality.

On the other hand, Rotter (1966) failed in two cases to predict petition-signing from locus of control. Thomas (1970) while attempting to find a bias in the I-E scale, managed to demonstrate that "internals" were more conservative than "externals". Minton (1970) in his male sample, failed to find any correlation between locus of control and liberalism/conservatism, left/right ideology, or attitudes in the area of international relations. Slight correlations were found in the female sample. A similar lack of correlation between political participation and locus of control was found by Evans and Alexander (1970). Hjelle & Clouser (1970), found little evidence to support the suggestion that internals would be less likely to smoke than externals. (Non-smoking was expected to relate to *active* concern for matters of health.) Goss and Morosko (1970) found that alcoholics (assumedly a "passive, apathetic" syndrome) were *internal*. Phares, Ritchie and Davies (1968), stating that "internals" were more willing to remedy "personality problems", may have found some support for the internal-active hypothesis, or they may have found evidence that internals are more conforming than are externals. A study by Ducette and Wolk (1972) noted significant differences in the level of aspiration of lower-class black high school students. Those who were *external* were more aspiring than the internals. Hersch, Kulik, and Schiebe (1969) found, in a study which contradicted their own previous results, that locus of control did *not* differentiate volunteers and non-volunteers for work in a mental hospital. Gurin, Gurin, Lao, and Beattie (1969) concluded that the prediction of social activity in their Negro sample could *not* be made on the basis of an undifferentiated I-E scale, but that certain orthogonal factors which they identified *within* an expanded scale could be used as more reliable predictors.

Results such as these must shed doubt on research which has used words such as "alienated", "powerless", "apathetic", "passive", "complacent", with reference to persons with an external locus of control. Rotter himself has said, "Clearly we need continuing study to reverse this trend [toward externality]. Our society has so many critical problems that it desperately needs as many active, participating internal-minded members as possible. If feelings of external control, alienation, and powerlessness continue to grow, we may be heading for a society of dropouts—each person sitting back, watching the world go by" (Rotter, 1971). Such an outlook does little to encourage consideration of the possibility that external locus of control may have its good points.

And it certainly *is* possible to contend that an external locus of control has positive aspects. These would include a more liberating attitude to interpersonal (and other) relationships, greater tolerance of chaotic and unpredictable situations, a more realistic appraisal of the nature of what influences us, and a less overt desire for power. Whether or not subsequent research investigates these possibilities, the present point is that such a positive approach to external locus of control has not been assumed with anywhere near the frequency that it has been assumed for internality. We feel that this is largely due to the nature of the terms used, which bias our thinking badly in favor of the "internal" personality.

The I-E Scale

Support for taking a new look at the locus of control construct comes from several sources. Coan (cf. Dies, 1968) found that the I-E scale favors items which deal with social and political events rather than items dealing with personal qualities or interpersonal concerns. Mirels (1970) isolated factors relating to (1) personal control, and (2) control over larger interests. Gurin, Gurin, Lao, and Beattie (1969) factor analyzed an extended I-E scale and found several orthogonal factors. Within the 23 items of Rotter's scale itself, they identified two distinct measures:

1. Control ideology: a measure of the subject's "world-view" or general belief in the mechanisms of control. Items of control ideology are, explicitly or implicitly, third person.
2. Personal control ideology: a measure of the subject's assessment of his individual control of personal events. These items are phrased or interpreted as first person.

Prediction of social activity, they found, *could* be made on the basis of these sub-scales *plus* a measure they termed "Individual-System Blame Attribution". But when the measures of control ideology and personal control were undifferentiated, such predictions could not be made.

The implication of these studies is that the locus of control scale may not be measuring exactly what it purports to measure. For example, here are the responses to item 18: (a) (external)—"Most people don't realize the extent to which their lives are controlled by accidental happenings", and (b) (internal)—"There is really no such thing as 'luck'" (Rotter, 1966). We are tempted to reject "a" on the ground that even though we may realize accidental happenings can have important effects, we are by no means willing to concede that they "control" us in any sense. But "b" may be even less palatable since "luck" plainly does exist and we are asked to deny that this is true. This problem may be typical of most forced choice items, but the analysis by Gurin *et al.* helps us to recognize a further problem.

If we orient ourselves in terms of control ideology (a "world-view") then philosophical determinism might propel us to answer "b", while a philosophy of "hazard" dictates "a". We might be very tempted to answer "a" if we are black, or Jewish, or short, or beautiful, or identify some accident of our situation as being extremely important to success. We would answer "b" if we strongly believed that none of these "accidents" were at all important. On the dimension of personal control ideology we might choose "a" if our personal history of success/failure included important results of "accidents" and "b" if such a history showed the results of luck to be minimal compared to the effects of our wilful choices and actions. The important point here is that any individual could give a different response to the question on different dimensions. Which of these is the I-E scale actually measuring? The argument is that it is the *personal control* dimension, but some items are open to the alternate interpretation, and some items plainly contradict this. Item 12 is one example: 12 (a) (internal)—"The average citizen can have an influence in government decisions."; (b) (external)—"This world is run by the few people in power and there is not much the little guy can do about it." This

item is quite obviously a measure of an attitude towards a socio-political problem (control ideology) rather than a measure of personal control. The assumption is that the respondent will replace "the average citizen" with "I", but a legitimate response can be made to the literal question. This response might be "a", in favor of a "citizens'" control, even though the subject does not care about exercising his personal vote or voice.

A final characteristic of the scale (and of the basic hypothesis) merits consideration. The purpose of the scale is to differentiate individuals along a dimension whose *extremes* are a belief in total personal control and belief in the total lack of personal control. Between these extremes stretches the continuum of locus of control. (Users of the scale recognize that extreme responses are unlikely and that most subjects score in an intermediate range.) It is assumed that the continuum will, as we approach the external extreme, show an increasing concern with matters which are progressively further beyond personal control. This assumption however, is *not* legitimate, given the structure of the scale. We are asked to orient ourselves between "within my personal control" (internal) and "due to luck, etc." (external). There is no place on this continuum for a response such as, "to some extent I am controlled by [a particular] legitimate social-physical force". The nature of this dichotomy ignores measurement of the degree to which subjects endorse other kinds of control or influence which do not even involve luck, fate, control by powerful others, or accident—such items as heredity, the mood of a wife, highway conditions, normal social and group pressures, and economic facts. We can respond that our personal control is powerful (compared to luck), or weak (compared to luck), but we cannot respond with an indication of what other, commoner and less extreme sorts of external control we feel are most important and influential.

The internal or external is therefore characterized by his attitude to luck, fate, control by powerful others, or accident, rather than by his attitude to the controls exerted by a real social and physical setting. The second measure, related to certain plausible events, is what we *need* to generate viable behavioral hypotheses—the first, relating our attitude to "overwhelming" controls only, is what Rotter makes available.

Applying this to our discussion of the "apathetic" external (or external teacher), we realize that the stated purpose and the construction of the I-E scale encourages the passive view by characterizing the external along the narrow dimension of belief in luck, fate, etc. The subject's orientation to real and common types of actual controlling forces, in a real physical-social world, is not surveyed; but it is a measure such as this which would more legitimately enable us to predict initiative, drive and ambition.

Research workers who are interested in locus of control will need to construct a scale in which the items range over a continuum of controlling forces (slight to extreme), where the subjects are asked to respond with a scaled measure of the extent to which they feel influenced by each item. Luck, fate, powerful others, and unpredictable events would then be subsets within a scale which could also include more realistic physical-social controls.

In summary, we feel that the implicit assumption that an internal locus of control represents a more positive approach to life should be abandoned until further investigation confirms this expectation. The references cited earlier provide some evidence for characterizing the internal as less open, less realistic, more controlling, less tolerant of chaotic situations, more defensive, more self-centered, and more restricting in interpersonal relationships. The notion that internals will be less coercive of others should be re-evaluated.

The relationship of locus of control to a tendency towards action, or complacency, is not a simple one, and the implicit assumption that the "external" should be more passive is not supported. The abandonment of such pre-conceptions as this will free thinking regarding locus of control, and enable less biased hypotheses and explanations to be generated.

In his monograph (1966) Rotter hypothesizes: "that this variable [locus of control] is of major significance in understanding the nature of learning processes in different kinds of learning situations". Effort should be made to apply the theoretical constructs of locus of control to the area Rotter indicates above—learning theory. The idea that a learner learns *better* if a reward or reinforcement is perceived as contingent on his own behavior rather than on luck, etc., is significant to teachers, creators of learning materials and methods, and curriculum developers. We can envision applications to guided discovery teaching methods, to student-directed learning, to lecture methods, graded and non-graded courses, mastery learning, behavior modification, and other concerns of educational theory and practice.

Such new applications of the locus of control construct would be far more useful to educators than the present applications have been to personality theorists.

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SACU Test Variables as Predictors of University GPA

The relative effectiveness of the School and College Ability Test, two SACU tests of ability, averages of Grade XII Departmental Examination scores, and averages of scores submitted by high schools in predicting university success was examined as it applies to Alberta. The study was based on a sample of Alberta students who wrote the SACU battery in 1969 and subsequently enrolled at The University of Alberta. The two sets of Grade XII averages were found to be the best predictors, and about equal in effectiveness. A difference between the means of over ten points was noted. The CELAT was found to be the best predictor among the standardized ability tests. Implications were drawn, focussing on the decision by the Alberta Department of Education to cease requiring students to write Departmental Examinations. (Dr. Nyberg is Associate Professor in the Department of Educational Psychology, The University of Alberta. Mr. Baril is a graduate student in the same department).

Background

A great deal of research effort has been devoted to the problem of predicting success at university. In Alberta, studies have focussed on Grade XII achievement scores and/or aptitude scores as predictors (Black, 1959, 1960, 1961, 1964, 1966, 1969; Black and Knowles, 1965a, 1965b; Conklin and Ogston, 1968; Evenson and Smith, 1957, 1958; Knowles, 1965). Studies in other parts of Canada are too numerous to list here.

In 1969 a new set of variables entered the field of predicting university success in Canada—the Service of Admission to College and University (SACU) test battery, consisting to date of an aptitude test and a test of English (or French) achievement. The purpose of this study is to examine the SACU variables in relation to other commonly used variables in predicting university success in Alberta.

In the spring of 1969 a sample of Alberta students, enrolled in Grade XII, wrote the Canadian Scholastic Aptitude Test (CSAT) and the Canadian English Language Achievement Test (CELAT). In 1972 a follow-up study was carried out involving students who had enrolled at The University of Alberta.

Purposes

The primary purposes of the study were as follows:

- (a) to determine the relationship between SACU test scores and University averages.
- (b) to compare SACU test scores with School and College Ability Test (SCAT) scores, Grade XII departmental examinations averages, and averages of school-assigned marks as predictors of University averages.
- (c) to determine the effect on predicting University averages of combining two or more of the measures.

Sample

The sample was chosen by selecting students at regular intervals from an alphabetical list of Grade XII students compiled by the Alberta Department of Education. When a name was selected the student was designated for testing only if he or she was in a matriculation program and attending a school situated in the area generally served by The University of Alberta; that is, from Red Deer and north.

A total of 675 names of Alberta students appeared on the computer print-out prepared by SACU. Of these, 306 represented students who subsequently enrolled at The University of Alberta.

Procedure

A list was compiled of students who had written the 1969 SACU tests and later enrolled at The University of Alberta. University grades for first and second year were collected for these students, and in addition Grade XII Departmental Examinations marks and Grade XII marks submitted by the schools were collected. The Departmental Examinations battery included the SCAT, level 1 test, as well as school subject examinations.

The following variables were involved in the processing of the data:

- School and College Ability Test, Verbal (SCAT-V)
- School and College Ability Test, Quantitative (SCAT-Q)
- School and College Ability Test, Total (SCAT-T)
- Canadian Scholastic Aptitude Test, Verbal (CSAT-V)
- Canadian Scholastic Aptitude Test, Mathematical (CSAT-M)
- Canadian Scholastic Aptitude Test, Total (CSAT-T)
- Canadian English Language Achievement Test (CELAT)
- Grade XII Departmental Examination Average (XII-Dept.)
- Grade XII Average of grades submitted by the school (XII-Sch)
- First year university grade point average (U-1)
- Second year university grade point average (U-2)

Means and standard deviations of these variables were calculated, and a matrix of the intercorrelations was computed. A number of multiple correlations were computed, employing first year GPA (U-1) as the criterion.

Results

Means and standard deviations for the 306 cases are shown in Table 1.

TABLE 1
MEANS AND STANDARD DEVIATIONS OF PREDICTOR AND
CRITERIA VARIABLES

	SCAT-V	SCAT-Q	SCAT-T	CSAT-V	CSAT-M	
Mean	41.18	43.57	84.78	531.8	556.1	
Standard Deviation	7.97	4.80	10.81	91.8	88.7	
	CSAT-T	CELAT	XII-Dept	XII-Sch	U-1	U-2
Mean	1088.2	529.0	73.33	62.73	5.59	6.12
Standard Deviation	150.9	98.3	8.03	9.58	1.36	1.17

The matrix of correlations for the eleven variables is shown in Table 2. The number of cases is 306.

TABLE 2
CORRELATION MATRIX OF ELEVEN VARIABLES

	SCAT -Q	SCAT -T	CSAT -V	CSAT -M	CSAT -T	CELAT	XII- DEPT	XII- SCH	U-1	U-2
SCAT-V	386	911	777	304	668	607	490	343	321	242
SCAT-Q		729	290	563	514	309	362	284	151	152
SCAT-T			703	473	721	585	523	378	305	246
CSAT-V				346	833	667	571	441	419	262
CSAT-M					808	295	555	388	135	110
CSAT-T						593	686	507	343	219
CELAT							593	523	483	282
XII-DEPT								773	566	441
XII-SCH									532	456
U-1										762

Decimal points omitted.

Table 3 shows a number of multiple correlations, all of which have grade point average in first year university as the criterion. The multiple correlations are arranged in order of magnitude.

Some of the figures in Table 1 are somewhat unexpected. The mean score for SCAT-Q (43.66) is higher than for SCAT-V despite the fact that the total possible for SCAT-Q is 50 while for SCAT-V it is 60. The low

TABLE 3
RELATIONSHIP BETWEEN FRESHMAN GPA AND COMBINATIONS OF
OTHER VARIABLES

Variables	Multiple Correlation	Variables	Multiple Correlation
CSAT CELAT XII DEPT	.608	CSAT V CELAT XII SCH	.589
CELAT XII DEPT XII SCH	.608	SCAT T CSAT T CELAT XII SCH	.584
CSAT V CSAT M CELAT XII SCH	.602	CSAT CELAT XII SCH	.584
CELAT XII DEPT	.595	CELAT XII SCH	.583
SCAT CSAT V CELAT XII SCH	.590	CSAT V CSAT M CELAT	.502
		CSAT V CELAT	.500

standard deviation for SCAT-Q suggests that there is a ceiling effect in operation.

A rather surprising result was the difference between the means of the Grade XII marks on departmental examinations (XII Dept.) and those reported by the schools (XII Sch.). One might expect teachers to be more lenient in giving grades, but the opposite is true. Black and Knowles (1965b) noted a similar effect, with a difference of about one. The difference of over ten points, noted in Table 1, is indeed unexpected.

The most important findings based on Table 2 are as follows:

- (a) The best predictors of first year university GPA are Grade XII departmental examinations and Grade XII grades reported by schools. The correlations with university GPA are almost identical.
- (b) Of the standardized tests, the best predictor is CELAT, which correlates (.476) almost as high as the two sets of Grade XII scores.
- (c) In the SCAT and CSAT tests, the verbal scores are the best predictors of first year university grades.

Table 3 reveals that several combinations of scores yield multiple correlations of about 0.6.

The best pair of predictors, according to Table 3, is CELAT and XII-Dept., however the multiple correlation is not significantly higher than that for CELAT and XII-Sch. It may also be noted that adding other predictors improves the correlation only slightly.

Summary of Findings

1. Mean grades reported by schools average about ten points lower than grades received on Grade XII departmental examinations.

2. Grade XII departmental scores and Grade XII scores reported by schools correlate about equally with first and second year university grade point averages.
3. The single testing instrument that best predicted freshman grade point average was the CELAT. The correlation was only slightly lower than that based on the Grade XII departmental battery or on Grade XII marks submitted by schools.
4. The highest multiple correlations, using freshman grade point average as the criterion, clustered about 0.6. This value could be approached using only two predictors—CELAT and Grade XII departmental grades, or CELAT and Grade XII marks reported by the schools.
5. Validity coefficients were highest for the verbal subtests of the ability tests. This finding does not agree with results reported by Black (1959).

Implications

This study has special implications in view of the decision, by the Alberta Department of Education, no longer to require Grade XII students to write Departmental Examinations.

Grades submitted by schools have been about as effective as predictors of university GPA as Grade XII departmental examinations scores, however, once the “departmentals” are removed there is no guarantee that school grades will continue at the same level as predictors. In the past, schools have had prompt “feedback” regarding the grades that were submitted in June. Once this feedback is removed the criteria for grading might very well change.

The fact that grades submitted by schools were generally lower must also be taken into account.

The number of students who write Departmental examinations will be greatly reduced, thus making it difficult to establish norms of achievement. When large numbers were tested, a relative system of grading was employed. This system cannot be used with a small group unless an “anchor” test is given to at least a representative sample of Grade XII students. This study suggests that the CELAT would be effective.

The study was limited in that no attempt was made to subdivide the sample of students according to university faculty. Subgroups would be too small to serve as a basis for making reliable conclusions. It is quite likely that correlations between predictors and criteria would vary considerably from one faculty to another.

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LOLITA WILSON

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Canadian Indian Children Who Had Never Attended School

Children from isolated areas may be handicapped on the usual school placement tests. Thirty Indian children, aged 6 to 12 years with little or no formal education achieved scores on the Raven Progressive Matrices, and the performance portion of the Wechsler Intelligence Scale for Children, very similar to thirty non-Indian school children of the same age and similar "socio-intellectual" background. The test scores of a third group of school children from intellectually enriched home backgrounds were significantly higher than either of these groups. Indian children in a residential school made mean scores on the Wechsler Intelligence Scale for Children similar to Group 3. The results of the study appeared to be more related to environmental factors than ethnic ones. (Lolita Wilson is Assistant to the Vice-President (Academic) and Associate Professor of Psychology at Simon Fraser University, Burnaby, British Columbia).

This study was designed to compare the performance on selected intelligence tests of a group of children who had never been to school with the performance of a similar group of children who were attending school regularly.

The initial request for this comparison came from a medical doctor in the Northwest Territories. Many of the Indian children he worked with had had no formal education and it was not likely that their parents would teach them. He was apprehensive about the use of routine achievement tests to assess these children when they did go to school. He was, in effect, interested in the children's ability rather than their formal achievement; in their intellectual potential rather than their ethnic origin.

The effects of marginality on Indian and other children has been the subject of many studies. Bowd (1972) covers the literature thoroughly. However, such children are usually in some type of school. The present study is one of the few in which there are children of school age who have never attended school.

When the study began there were many Indian children in the Charles

Camsell Hospital, Edmonton, Alberta. At least thirty of them, between the ages of six and twelve, had never been to school. Their short-term hospitalization was of a kind which did not affect their intellectual functioning nor did it give them a chance to attend classes in the hospital school. The plan was to compare these children with a similar hospitalized group of non-Indian children who were attending school regularly. A "socio-intellectual" base for matching home backgrounds was substituted for the usual "socio-economic" category.

The tests used were those which do not rely on written or oral language, in this case the Raven Progressive Matrices (1947) and the performance portion of the Wechsler Intelligence Scale for Children (WISC).

The parents of the children in the two hospitalized groups did not appear to have the necessary resources or background to supplement the classroom experiences of the children who were attending school or to make up for the lack of such experiences in the Indian group. On the other hand, the parents of the children from the "intellectually privileged" homes did have these resources. An Indian residential school near Edmonton, in which some of the staff acted as surrogate parents to the children, provided a background somewhere between the intellectually privileged group and the two hospitalized groups.

It was hypothesized that the children from the intellectually enriched home environments would have significantly better means test scores than either of the hospitalized groups. It was also hypothesized that the differences would be greater on the WISC than on the Progressive Matrices, on the assumption that the latter is less culturally loaded. How the two hospitalized groups would compare was the open question.

Subjects

Each group consisted of 30 children, comparable in age and sex, with an age range from 6 to 12 years. Except for the Indian children who had never attended school, each child was in the school grade appropriate to that child's age.

- Group 1:* Indian children from the Charles Camsell Hospital. This consists of the children who had never been to school.
- Group 2:* Non-Indian children whose parents were classified as "unskilled workers".
- Group 3:* Children whose parents were faculty members or professional persons whose level of academic study would be similar to that of a faculty member.
- Group 4:* Children attending an Indian Residential school. Their test scores on the WISC are included for general interest.

Method

To keep the test administration as uniform as possible all the tests were administered individually by the author. As it had been suggested that some of the Indian children did not understand English, the tests were administered non-verbally. In fact all the children understood spoken English, but the non-verbal administration was continued.

The Progressive Matrices, which are designed for non-verbal administration where necessary, were presented first, followed by the

performance portion of the WISC. The order of the two tests was not alternated because the children, rather than the tests, were being assessed. In effect the two tests were treated as one test with eight sub-tests.

Results

Table 1 gives the mean sub-test and total scores on the Progressive Matrices. Table 2 shows the significance of differences among these mean scores, using a two-tailed “t” test.

There were no significant differences for the total test scores between the two hospitalized groups. On the WISC their scores were very similar in range and variability as well as means. This similarity was not as pronounced for the Progressive Matrices scores.

The children from the intellectually privileged homes had significantly better total scores on both tests and on most of the sub-tests when compared with any of the other groups.

On the one set of scores available, the total WISC performance, the Indian residential children were more like the intellectually privileged group than like either of the two hospitalized groups.

TABLE 1
RAW SCORES OF SUB-TESTS AND TOTAL RAVEN PROGRESSIVE
MATRICES (1947)

Sub-tests	Group 1, Indian Hospitalized		Group 2 Non-Indian Hospitalized		Group 3 Intellectually Privileged	
	\bar{X}	s.d	\bar{X}	s.d	\bar{X}	s.d
A	8.23	1.94	9.2	1.67	9.8	1.70
AB	5.76	2.88	6.8	2.58	8.3	3.03
B	3.70	1.89	5.3	2.62	7.8	3.47
Total	17.70	5.98	21.3	6.09	26.06	7.31
Range of Total Scores	9 - 28		12 - 34		11 - 36	

Two subtests were of particular interest. The hospitalized Indian children made significantly lower scores on the WISC picture arrangement sub-test than either of the two non-Indian groups. This may be the most culturally loaded sub-test, reflecting the geographical isolation of the children.

Sub-test B of the Raven Progressive Matrices was also significantly more difficult for the Indian hospitalized group. The test is intended to tap abstract reasoning and may reflect a more formal way of approaching a problem.

TABLE 2
SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS OF SCALED SCORES
OF PERFORMANCE SUB-TESTS AND TOTALS—WECHSLER INTELLIGENCE
SCALE FOR CHILDREN

Group 1 Indian Hospitalized	Group 2 Non-Indian Hospitalized	Group 3 Intellectually Privileged	Group 4 Indian Residential
Sub-tests	t	t	t
Picture Completion	(Identical mean)	3.6 **	-
Picture Arrangement	4.6 **	9.5 **	-
Block Design	.03	4.9 **	-
Object Assembly	1.66	3.5 **	-
Coding	.40	3.6 **	-
Performance I.Q.	1.02	8.2 **	4.10**
Group 2 <u>Non-Indian Hospitalized</u>			
Picture Completion	-	3.37*	-
Picture Arrangement	-	3.71**	-
Block Design	-	4.42**	-
Object Assembly	-	6.00**	-
Coding	-	5.60**	-
Performance I.Q.	-	6.80**	2.78*
Group 3 <u>Intellectually Privileged</u>			
Performance I.Q.	-	-	4.77**

* Significant at the .01 level

** Significant at the .001 level

Summary

Although the Indian children who were the focus of this study were all of school age, they were unique in having had no formal schooling. As it is not likely that such a situation will exist again for such a large sample of children, the study may add a new dimension to previous work by suggesting the possible influence of home environment regardless of the child's ethnic origin.

The element common to the two hospitalized groups was a home background which lacked both intellectual enrichment and the encouragement to develop formal learning skills.

The element common to the Indian Residential School group and the intellectually privileged group was contact with adults who had had considerable formal education and who could supply the children with enriched opportunities for learning in the time spent away from the classroom.

The study suggests that the potential of the older child entering a Canadian school for the first time can be assessed although the methods require time and specialized training. Given such an assessment, there is a basis for deciding on the amount of time and special attention the child

will need to learn basic skills and to be oriented to a formal learning process.

An understanding of the child's home environment would help in deciding the extent to which the school would need to supplement the child's learning experiences. A "minority-group" or "marginal" background could then be put into a more reasonable relationship with the child's educational process.

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Measured Intelligence, Family Size and Socio-economic Status

A sample of 144 Sydney junior high school children, divided into subgroups according to family size and socio-economic status, was tested on the Henmon-Nelson Intelligence Test. The results demonstrated the existence of a definite relationship between intelligence and socio-economic status, and a significant negative correlation between family size and IQ, except in the two upper socio-economic status groups. These results point to a changing relationship between intelligence and family size. The acceptance of a negative correlation between family size and intelligence must be modified by the realization that socio-economic factors may influence the relationship, and correlations may vary from social class to social class. (Dr. Kennett is Associate Professor of Psychology at St. Francis Xavier University, Sydney Campus).

Scores obtained by children on conventional intelligence tests may be influenced by the size of the family to which each child belongs and these scores apparently reflect, at least, the environmental opportunities available to the members of each family group. In the past, numerous studies (e.g. Bradford, 1925; Cattell, 1936; Scottish Council for Research in Education, 1933, 1949; Mehrotra & Maxwell, 1954; Nisbet, 1953; Sutherland & Thomson, 1926) have reported that large families have an adverse effect on performance on IQ tests. In other words, as the size of the family increases the mean IQ score for family members (i.e. children) decreases. Such findings have led to a generally accepted position that a significant negative correlation exists between measured intelligence and size of family.

In an attempt to understand this relationship better Maxwell (1954, p. 254) considered the possibility of the negative correlation between fertility and intelligence as a function of differences between social classes, but rejected this notion when, upon further analysis of the survey data, a significant negative correlation between IQ and family size remained within each occupational class.

However, other studies of about the same time disagree in part.

Several local studies in American, Canadian, French, German, Norwegian, and Swedish cities have shown that the negative correlation between income and family size prevailed only up to a certain income level (U.N. Department of Social Affairs, 1953). In addition Gille, Henry, Tabah, Sutter, Bergus, Girand and Bastide (1954) and Heuyer, Pieron, Pieron and Sauvy (1950), using data based on 95,237 French elementary school children, found that the negative correlation between intelligence and family size was clearly apparent among farmers, manual labourers, and clerical workers but rarely discernible in the managerial group and negligible in the professional class.

Furthermore, two earlier studies (Kiser, 1942; Kiser & Whelpton, 1944) indicated the usual relationship between socio-economic indices and fertility within a large range of subjects, but reported that this relationship changed from negative to positive in the highest income levels. Thus, it is quite feasible that the negative correlation between IQ and family size is really the outcome of the negative correlation between family size and SES.

However, with changing fertility patterns within SES groups (e.g. Elkin, 1964) such tendencies should be more noticeable. In fact, Douglas (1964), while finding the negative correlation between IQ and family size to persist even when SES groups were held constant, acknowledged that a lower correlation in the upper SES groups (managerial and professional) occurred. Likewise, Nisbet and Entwistle (1967) rejected the relationship between intelligence test scores and family size as just another aspect of the differences between social classes, but also admitted that these two upper SES groups had a lower negative correlation.

In recent years the acceptance of a negative correlation between family size and intelligence has been modified by the realization that socio-economic factors may influence the relationship, and correlations may vary from social class to social class. At the present time, a negative correlation seems to remain between IQ and family size in large, randomly-selected samples, but it would appear that this negative relationship does not hold in at least the upper or professional groups (Carter, in Meade & Parkes, 1966, p. 180), or in predominantly middle-to-upper SES samples (Kennett & Cropley, 1970; Kennett, 1973).

No doubt the trend among modern day families is to plan, with more success, the number of children they wish. Thus, with successful family planning and improved environmental conditions in affluent societies such as Canada, a new relationship between intelligence and family size may emerge. Indeed, with the passage of time, size trends and socio-economic opportunities will change thus influencing the relationship between IQ and family size.

Thus, the purpose of the present study is to investigate, in a middle-class sample of children, the relationship between intelligence and family size in order to ascertain whether or not, within the upper SES groups of the sample, family size has any relationship to how well a child performs on an intelligence test.

Method

Sample

The sample consisted of 144 Grade Nine students enrolled at an urban junior high school (approximately 440 Protestant children enrolled in the

school), situated in a good middle-class residential area in the city of Sydney, Nova Scotia, Canada.

The mean age of the 144 students was 14 years 7 months (SD = 8.3 months; range 18 years 1 month to 13 years 5 months) and they had a mean verbal IQ of 103.2 (SD = 11.6; range 80 to 130). The sample included 74 boys, from whom the mean verbal IQ was 102.3 (SD = 11.6; range 80 to 124), while the corresponding figure for the 70 girls was 104.2 (SD = 11.5; range 83 to 130). The mean age of the boys was 14 years 6 months (SD = 8.7 months; range 18 years 1 month to 13 years 5 months) and the girls 14 years 8 months (SD = 8.1 months; range 17 years 10 months to 13 years 6 months).

Although the sample is predominantly Protestant, the exclusion of Catholics with large families was considered of minimal importance as the differences in family size between Catholics and Protestants are narrowing (Dominion Bureau of Statistics, 1968), such that in 1961, the average Catholic woman of child-bearing age produced 2.87 children while the average Protestant woman produced 2.35 (Dominion Bureau of Statistics, 1968).

Tests

The specific intelligence test used was the Henmon-Nelson Test, Grade Nine to Twelve, Form A, an instrument particularly suited to the measurement of a general intelligence based on verbal skills for children in Grade Nine. The test is given to all Grade Nine children attending school in the city of Sydney.

Socio-economic status was based on father's occupation (Kahl & Davis, 1955; Kennett, 1972).

Procedure

The Henmon-Nelson Test was administered to the Grade Nine sample in January 1971, while father's occupation and family size were obtained from the school Records and confirmed by a brief individual interview with each subject.

On the basis of the information collected, the 144 children were divided into subgroups according to the number of children in their families. Four such subgroups were defined, involving children from one- and two-child families, children from three-child families, children from four-child families and children from families of five or more.

A second distribution of the children was made according to SES (Edwards, 1943; Kennett, 1972). The children from professional and semi-professional homes made up SES group I and II (combined), children from families whose father belonged to the occupational group of lower managerial, salesmen and clerks belonged to SES group III, SES group IV were children of skilled workers (trade supervisors and tradesmen), while the lower two groups of children of semi-skilled and unskilled fathers were pooled to form SES V and VI (combined).

Data Analysis

Differences in mean IQs among socio-economic status groups were tested using the analysis of variance procedure described by Ferguson (1966, pp. 300-323).

Results

The Grade Nine sample of 144 children showed a mean family size of 4.3 (SD = 2.2), while the split for sex showed a mean family size for boys of 4.2 (SD = 2.2) and for girls 4.4 (SD =2.3). The distribution of mean family size within socio-economic subgroups indicated that, within the lowest SES group, family size is still the largest. From highest to lowest SES groups the distribution of mean family size is 4.0, 3.9, 3.5, 4.6, and 5.6.

Analysis of variance showed a definite relationship between intelligence and socio-economic status ($F = 3.56$, $df = 4/139$; $p < 0.01$), and further confirmed the numerous studies which have reported a positive relationship between IQ and SES.

TABLE 1
MEAN IQs AND SDs FOR BOTH SEXES AND FOR THE FULL SAMPLE IN
RELATIONSHIP TO FAMILY SIZE

Family size		1 or 2	3	4	5 or more
Male	N	11	25	14	24
	Mean	100.5	104.8	99.6	101.9
	SD	11.0	10.9	9.4	13.1
Female	N	14	18	10	28
	Mean	109.9	105.5	106.8	99.6
	SD	11.5	12.1	13.1	8.2
Total	N	25	43	24	52
	Mean	105.8	105.4	103.9	99.8
	SD	12.4	11.6	12.5	10.3

These data satisfy the requirements of within cell homogeneity of variance

$(F_{\max} = 2.3; \text{ df} = 4/48)$

TABLE 2
SUMMARY OF ANALYSIS OF VARIANCE FOR FAMILY SIZE, SEX
AND INTELLIGENCE

Source	Sum Squares	df	Mean Square	F
Sex	49.1	1	49.1	0.38
Family Size	823.0	3	274.3	2.10
Sex x Family Size	703.3	3	234.4	1.80
Within Cell	17,737.0	136	130.4	

Means and standard deviations of IQ scores for the four family groups are shown in Table I, while a summary of the analysis of variance on these data is shown in Table II. The analysis of variance showed that there were

no significant differences between mean IQ for groups of children coming from families of varying size ($F = 2.1$; $df = 4/139$; not significant). However, correlational data for males, for females, and for the full sample, when IQ was examined in relation to family size, showed significance at the 0.05 level for the three groups. The correlations were -0.23, -0.39, and -0.31 for males, for females and for the full sample respectively.

Finally, the relationship between intelligence and family size was calculated for the four separate SES groups, with the mean and standard deviations of family size and IQ for the four SES groups given in Table 3. The correlation coefficients were 0.00, -0.36, -0.42 and -0.36 from the highest to the lowest SES group, respectively.

TABLE 3
MEANS AND SDs OF FAMILY SIZE AND MEASURED INTELLIGENCE
FOR THE FOUR SES GROUPS

	Family Size	IQ
SES I & II (N=43)	4.0 (SD=1.5)	107.1 (SD=10.8)
SES III (N=28)	3.5 (SD=1.5)	103.4 (SD=10.4)
SES IV (N=50)	4.6 (SD=2.5)	101.8 (SD=11.9)
SES V & VI (N=18)	5.6 (SD=2.9)	96.4 (SD=9.2)

Discussion

The reporting of a definite relationship, between measured intelligence and socio-economic status, in favour of the high SES groups, added further support to the numerous studies (e.g. Kennett, 1972) claiming a positive correlation between IQ and SES membership.

However, the major finding is centered upon the relationship between IQ and family size. The Grade Nine sample, consisting of 33% from SES I and II, 19% from SES III, 35% from SES IV, and 13% from SES V and VI, resulted in a significant full sample negative correlation (-0.31, $p < 0.01$) between intelligence and family size. Such an overall negative correlation supports the findings of Bradford (1925), Douglas (1964), Nisbet (1953), Nisbet and Entwistle (1967), Scottish Mental Survey (1933, 1949) and Sutherland and Thompson (1926), all of whom, concluded that as family size increases, mean IQ for the family decreases.

On the other hand, an examination of SES groups in relation to IQ and family size reveals that upper SES groups failed to demonstrate the negative correlation reported to exist for the full sample. In this case the insignificant correlation (0.00), based upon a subsample of 48 students with a mean family size of 4.0, suggests that, in at least upper SES groups, no relationship exists. Furthermore, these results hint at the possibility that the negative correlation between IQ and family size is, at least in part, an artifact of SES membership.

Numerous explanations (e.g. Kennett & Cropley, 1970) exist to explain the lack of a significant relationship between IQ and family size in a pre-

dominantly middle- to upper SES sample. For example, upper SES infants receive varied sensory stimulation, more individual adult attention, adequate, and even excellent pre-natal and delivery care and enjoy excellent nutrition and medical facilities. Again such explanations add weight to the argument that family conditions rather than family size is the major contributor to the frequently reported negative correlation between IQ and family size.

Although the relationship between fertility (measured by size of family) and socio-economic status is changing (Elkin, 1964; Westoff in Freedman, 1965), the middle and upper SES families continue to produce smaller families. While the family size in industrial Cape Breton is above the national mean, evident in the present study with a mean family size of 4.3 as compared with the national estimate from the Dominion Bureau of Statistics (1968) of 3.6, the general trend of upper SES groups having smaller families is still confirmed in this Cape Breton sample. As in most samples (e.g. Kennett & Cropley, 1970; Nisbet & Entwistle, 1967) the lower SES groups in the present study have the largest mean family size, while the second-to-lowest SES group contains the second-to-largest mean family size.

Upper SES children perform equally as well on an IQ test irrespective of the size of the family to which they belong. Such a performance, when compared to the negative correlation of IQ and family size in the lower SES groups, supports the belief that the inverse relationship of socio-economic factors with family size suggests a similar inverse relationship between intelligence and family size.

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The Efficacy of Immediate Knowledge of Results for Tracking Musical Form

The purpose of this study was to discover whether knowledge of results provided by a system of electric response boxes would prove effective for training musically unsophisticated grade VII children to keep track of the forms of unfamiliar classical minuets and movements in sonata-allegro form and to notice the more elementary musical qualities of the movements tracked. A two group "post-test only" experimental design and stratified random sampling procedures were used. The subjects were 43 children in the band program of the Music Education Laboratory.

The findings were that there were no significant differences in either of the tasks being tested. (Dr. Smith is Associate Professor in the Department of Secondary Education, The University of Alberta).

This is a report on the efficacy of immediate knowledge of results provided by means of electric response boxes for developing in musically unsophisticated grade VII children the ability to keep track of the forms of minuets and sonata-allegro movements, and simultaneously to notice more elementary aspects of the music tracked. The material for this report is drawn from a larger study of the feasibility of tracking musical form as a cognitive objective for listening to music.

The decision to investigate this topic resulted from the systematic review of two literatures: one concerning the effectiveness of immediate knowledge of results, the other concerning the objectives of music listening. Whereas the former revealed much agreement as to the effectiveness of knowledge of results for encouraging learning, the latter left much unanswered. Although there is substantial agreement among aestheticians, musicians, and music educators that the most important objective of music listening is the detection of musical form, no literature exists either describing the behavioural implications of such a general objective, or proposing methods for assisting students to accomplish it. In the present study, therefore, one possible behavioural implication of such an objective: i.e., tracking, is postulated, and the effectiveness of one method of providing immediate

knowledge of results: i.e. the use of electric response boxes, for developing that behaviour is tested.

It is important to stress that there is no literature either to support or to deny the central postulate of this study—that detecting musical form involves tracking. A consideration of the temporal nature of music, however, gives strong reasons for this conclusion. Music occurs in time and its form cannot be detected in an instant as can that of a picture. Indeed, music's form—its wholeness—can never be *heard* because the limitations of memory preclude the simultaneous aural awareness of all of its parts. What can be heard, however, is music's *becoming whole* and it is the noticing of this which is taken in this study to be the meaning of detecting form.

In order to provide testable behaviours for this study, two further assumptions were made. Firstly, it was assumed that a listener who is noticing the *becoming whole* of a musical work is aware from moment to moment of the point to which the work has progressed, an assumption which presupposes foreknowledge of what to expect as one listens. Secondly, it was assumed that such a listener would be able, when asked, to name the formal point to which the work has progressed, and that the ability to do this can be taken to be reliable evidence that he is keeping track.

Two tasks were tested in this study: the naming of the formal points to which prematurely terminated minuets and sonata-allegro movements had progressed at the moment of their termination; and the answering, immediately after the point of termination has been named, of true-false questions about briefer elements of each movement. Specifically, the purposes of the larger study were to discover:

1. whether musically unsophisticated grade VII children can be trained to keep track of the unfolding forms of unfamiliar minuets and sonata-allegro movements,
2. whether reinforcement through the use of electric response boxes will facilitate the training of subjects to keep track and/or answer the true-false questions,
3. whether those who keep track can answer the true-false questions more efficiently than those who do not, and
4. whether there is a correlation between keeping track and answering the true-false questions.

While five null hypotheses were formulated for testing in the larger study, only two of these are relevant to the present article.

Hypothesis 1: There is no significant difference between the performances of the control and experimental groups in estimating formal points of termination in the items of the post-tests.

Hypothesis 2: There is no significant difference between the performances of the control and experimental groups in answering the true-false questions on the post-tests.

Before progressing to the main topic of this paper, the findings of the other parts of the main study will be stated.

1. The number of correct estimates of termination greatly exceeded that expected on the hypothesis of equal probability in seventeen of the twenty post-test items.

2. Correct estimators of formal points of termination scored significantly better than incorrect estimators on the true-false questions of three minuets and two sonata-allegro movements. Incorrect estimators scored significantly better on only one item. There were no significant differences between the two groups on the fourteen remaining post-test items.

3. In the case of the minuets— but not of the sonata-allegro movements—a significant relationship was found to exist between the ability to estimate formal points of termination and the ability to answer the true-false questions.

From these findings it was concluded that musically unsophisticated grade VII children could be taught to keep track of the unfolding forms of unfamiliar minuets and sonata-allegro movements with only minimal initiation to the intricacies of music theory, and that tracking unfamiliar minuets seems to improve the listener's awareness of the briefer elements dealt with in the true false questions.

The Review of Literature

The Experimental Method as Programmed Instruction—The experimental method of this study is in some ways comparable to the procedures of programmed instruction which Deterline describes as including:

the active role assigned to the student . . . logically sequenced small steps systematically moving to specified goals, immediate knowledge of progress for the student, and self-pacing by the student (1962, p. 4).

Only two of these characteristics are unequivocally accomplished in the present study: the student's active role, and immediate knowledge of results. These are both made possible by the use of response boxes. All of the other characteristics are either unattainable or subject to interpretations which depart from their usual meaning in the context of programmed instruction. "Self-pacing by the student" is, of course, impossible since to permit this would necessitate the alteration of the flow of musical time and constitute a violation of the music itself. The "specified goal" (i.e., knowing from moment to moment the formal point to which a minuet or sonata-allegro movement has progressed) is not the culmination of a succession of small steps moving "to" it, but rather a matter for continuous attainment with the steps being merely check-points in its continuity. While the steps are "logically sequenced", their logic and sequence derive not from subject matter structure but rather from formal progression in music. Furthermore, to speak of the steps as more or less "small" seems less apt than to speak of them as more or less predictable.

Knowledge of Results

Knowledge of results or feedback is a species of reinforcement which has at least two sources for its effectiveness. One is the desire of most learners for the social approval that comes from being told that what they have done is correct. The other is the need for the learner to know how he is doing as he performs a task. The former position is championed by Skinner and is an important premise behind his concept of the teaching machine. The

latter was discovered much earlier by Thorndike in his research involving subjects drawing three inch lines without the aid of measuring instruments.

Knowledge of results can be positive or negative, the subject in the latter case being informed that his response is incorrect. In one sense, such negative feedback can be interpreted as social disapproval. In another sense, it can be seen as the type of information provided in the Thorndike line-drawing study. As Stolurow observes, however, such information will not usually be as effective for shaping behaviour as positive feedback because:

where there are many possible wrong responses, knowledge that the correct response was made is very informative; however, knowledge that the response was wrong only eliminates that alternative. It may not also indicate to the student the correct response. (1966, pp. 171-172).

The need to provide knowledge of results *immediately after* the response of the subject has occurred has been one of the canons of the advocates of programmed instruction (Schramm, 1964, p. 10). There is, however, sufficient evidence to the contrary to cast doubt upon this principle. On the one hand, Spence has reviewed studies with rats that seem to suggest "that reinforcement will remain effective despite delay, if the subject maintains an orientation both toward the objects that constitute the task and toward the reinforcement agency". (Travers, 1967, p. 88). On the other hand, von Wright's researches with subjects following a path through a maze presented on a moving band of paper demonstrates the efficacy of advance information (Travers, 1967, p. 113).

The question of which type of reinforcer is most effective with human subjects has been researched by Travers (1967, p. 106) who found no significant differences as reinforcers between the words *right* and *wrong*, an electric shock, and a tone of 400 cycles per second. With half the subjects the reinforcement was used for correct responses, with the remainder for incorrect responses. Travers concluded from this and other of his studies that "the characteristic of an event that determines, above all, its reinforcing properties for human subjects is the amount of information it carried".

If a child is motivated to solve a problem, then the condition in his environment most likely to influence the course of learning is that which provides useful information. The other characteristics of the information source are trivial (1967, p. 107).

In the light of the superiority of the performance of the control group over that of the experimental group in this study, the possibility must be considered that keeping track of musical structure is a self-reinforcing or autotelic activity akin to reading a book (Silberman, 1965, p. 530). The notion of self-reinforcement is, of course, a purely theoretical construct to permit the theory that reinforcement is necessary in *all* learning situations to be maintained by psychologists of that persuasion. It is possible that reinforcement is not always needed for learning to occur.

The EDEX Research

The only study which resembled the present one in its methodology was the EDEX "systems" research of Weisgerber and Rasmussen

(Rasmussen, 1965, and Weisgerber and Rasmussen, 1965). Both studies employed response boxes. Here, however, the resemblance ceases since: 1. the EDEX equipment was intended to give the teacher rather than the subjects immediate knowledge of results; 2. it required the constant halting of the music to permit the asking of questions, response to them, and noting of the class performance by the teacher; 3. the preparation of lessons was scheduled according to a "hypothetical sequence" which the researchers theorize is organized from simple to complex; and 4. questions about form are confined to thematic and non-thematic materials, rondo form, and theme and variations.

Research Design

To test the educational effectiveness of the system of reinforcement used in this study, a two-group "post-test only" experimental design was used: an experimental group taught with the assistance of the response boxes and a control group taught the same content but without the response boxes. This design was employed because the musical naivete of the subjects precluded the use of a pre-test. In their discussion of this design, Campbell and Stanley (1968, p. 65) observe that its principal disadvantage is that although "it controls for testing as main effect and interaction, . . . it does not measure them" as a pre-test—post-test design does. This, however, is not crucial in the present study since the question being investigated is not the amount of effect of the experimental method, but whether it has an effect, and for this purpose the post-test only design is entirely adequate.

Randomization Procedures

One important requirement of the two group "post-test only" design is that the two groups be properly randomized. In this study, randomization was complicated by the requirement that each group be a properly instrumentated band, by considerable diversity in the musical backgrounds of the subjects being used, and by the fact that individual physical handicaps made it impossible to assign all of the subjects to the instruments of their choice. To cope with these factors, it was decided to employ the procedures of *stratified-random sampling* which J. P. Guilford (1965, p. 141) says are "likely to be more representative of a total population than a purely random sample".

The assignment of the children to instruments was carried out with no thought for randomization, it being assumed that the possession of the physical characteristics desirable for performance on particular instruments would have no implications for the listening skills under consideration in this study. Thus the children were assigned to the several band instruments in sufficient numbers to instrumentate two small bands. As far as possible, the children were given the instruments of their choice. When assignment to instruments was completed, all of the children assigned to the same instrument were studied to ascertain their musical experience and whether or not they had received an instrument of their choice. The children were then paired on the basis of these distinctions and assigned to one or the other of two beginning bands through the use of a

table of random numbers. The two bands were named "Excelsior" and "Foremost" and the latter was assigned to be the experimental group through a further use of random numbers.

The Experimental and Control Groups

The bands which resulted from the assignment procedures described above were quite similar when compared on the basis of sex, age, schools attended (public and separate), and performance on both the *Farnum Music Notation Test* and the *Seashore Measures of Musical Talent*. The overall score for the combined groups on the latter was 53.0% with the control group average being 52.3% and the experimental group average being 53.5%. The overall average score for the combined groups on the former test was 60.9%, a trifle higher than the normal average. Once again, the difference between the two groups on the *Farnum Test* was slight with the control group average score being 62.7%, and that for the experimental group being 59.3%.

TABLE 1
CONTROL AND EXPERIMENTAL GROUP AVERAGE PERFORMANCE ON THE
SEASHORE TESTS

	Pitch	Tonal Memory	Time	Rhythm	Timbre	Inten- sity	Overall
Control	58.6	50.8	62.0	56.3	50.8	40.2	52.3
Experimental	59.2	62.8	52.7	49.9	62.9	33.4	53.5
Combined	58.9	56.9	57.2	53.0	57.0	36.7	53.0

The Schedule of the Study

The study was completed in two phases; the first devoted to the study of the minuet taking place during October and November, 1969, and the second devoted to sonata-allegro form taking place between January and March of 1970. All training sessions for the first phase were thirty minutes long and involved a total training time for each group of 210 minutes. During the second phase, both groups received 270 minutes of training. However, while the control group received this in nine sessions of thirty minutes each, the experimental group received it in six sessions of forty-five minutes each. The post-tests were administered at the same time and on the same day of the week as each group had received its training: the control group on a Wednesday and the experimental group on a Saturday.

MELAB—The Setting of the Study

This study was conducted during the 1969-1970 school year in a workshop program of secondary school music teacher training called the Music Education Laboratory (MELAB). The principal reason for using the MELAB facilities rather than a conventional classroom setting was the possibility of randomizing the control and experimental groups in MELAB.

MELAB was inaugurated in 1963 at the Faculty of Education in The

University of Alberta at Edmonton, Canada. All secondary school music majors participate in MELAB during the third year of their university program in lieu of the customary practice teaching in local high schools. During this first involvement in MELAB, the student-teachers collaborate in training beginning bands and orchestras of grade VII children recruited from the public and separate schools of Edmonton. Student-teachers may participate again in MELAB in their fourth year. The fourth year program involves them in training intermediate and advanced bands and orchestras of children who elect to continue in MELAB after grade VII. The student-teachers are counselled and their work is supervised by university staff and master teachers from the local public and separate school systems. MELAB meets every Wednesday between 5:00 p.m. and 7:00 p.m. and every Saturday between 9:00 and noon throughout the university year.

The forty-three children who served as subjects for this study were among a group of eighty grade VII children recruited in September 1969 for membership in the then new beginning band and orchestra programs. Since the number of children asking to play string instruments was smaller than that asking to play band instruments, it was decided to use the latter as the subjects for this study.

Recruiting was done by the student teachers who visited the grade VII classrooms of forty Edmonton schools where instrumental music was not yet taught. There they explained MELAB to the children and distributed applications to those children who expressed interest. The advantage of this procedure is that it gives the chance of first refusal to the child thus precluding applications on behalf of reluctant children by ambitious parents. Around twelve hundred applications were distributed and of these eighty were returned to the university. During the year of this study, all eighty applicants were accepted for membership.

Training Procedures

The purpose of the training sessions was to prepare the subjects to perform two kinds of task when listening to minuets and movements in sonata-allegro form. First, they were to keep track of the unfolding forms of such movements and as evidence of this ability they were to name the formal points of termination when such movements were ended *in medias res*. Second, they were to notice structural and stylistic qualities of the music they track and to give evidence of this ability by identifying as true or false certain statements made about the music they had just tracked.

To prepare the subjects for these tasks, it was necessary to teach them how to track. This was accomplished firstly by providing them with expectations about the things they would hear as they listened to the music: the unfolding of certain formal sections in a predictable order, the kinetic-syntactic qualities of those sections, and the evidences of key change to be noticed in expositions and developments. Secondly, the subjects were assisted in noticing these things as they listened—the experimental procedure to be described shortly. Thirdly, it was necessary to teach a considerable amount of terminology which was usually done incidentally in the course of training how to track. From time to time, cumulative lessons were taught which drew together a topic which had been touched upon frequently in recent sessions.

Selecting the Musical Materials—The musical materials used for both the training sessions and the post-tests were chosen for the regularity with which they conformed to the conventions of the musical forms being studied. As a result, they were selected mainly from late classical repertoire. The formal criteria for selecting sonata-allegro movements included prominent kinetic-syntactic qualities, uncomplicated processes of modulation, the lack of exposition sections of unusual length, repeated expositions, and a variety of overall durations. The criteria employed for selecting the minuets were less demanding since the predominantly sectional nature of such movements rendered key relationships and kinetic-syntactic qualities less crucial to the exercise of tracking skills.

The Experimental Procedure—It is in the methods employed to train the subjects to track that the treatment of the experimental group differs from that of the control group. In both groups, listening was taught in a way that anticipated the procedures of the post-tests. After a prematurely terminated selection had been heard, each subject estimated where it had stopped and then the class discussed non-formal aspects of it. The control group was merely encouraged to keep track as a means of discovering where the music would stop. In the experimental group, however, immediate feedback was provided to each child as to the accuracy with which he had noticed certain formal events in the music. Each child was provided with a small metal box wired individually to one of thirty lights on a panel operated by the teacher. The teacher's panel also had a button, a time-lapse device, and a photo flash. Each child's box had a button and a red and green light.

When a child pressed his button, the light on the teacher's panel lit up, thus informing the instructor of the child's response. At the same time, one of the child's lights became lit depending upon whether his button had been pressed during the time lapse allowed following the instructor's pressure on his button or not. In the former case, the child's green light would glow. In the latter, his red. The photo flash was activated at the end of the time lapse as a signal to those who had failed to respond.

During the earlier listening sessions of each phase of the study, the subjects were told to push their buttons at the beginning of each main section in the work being heard. The teacher also pushed his button on these occasions. The result was that the children who pushed their buttons at the right time saw their green light go on. Those who failed to press their buttons at the right time were informed of the fact by the photo flash. If a button was pressed at any other time, the child's red light glowed. Later in each phase of the study, the subjects were told to press their buttons, not at the beginning of sections, but rather when they noticed (a) a departure in the music from normal formal procedures, (b) the appearance of elements of the new key in a transition, or (c) the recurrence of a theme during development.

Collection and Treatment of the Data

To test the hypotheses of this study, it was necessary to prepare two tapes of ten musical excerpts each—one of minuets, the other of sonata-allegro movements—and two corresponding sets of ten answer forms. The

musical items included on the tapes are to be seen in tables 2 and 3. These are all quite regular examples of the forms they exemplify. Termination points for all excerpts are in the midst of sections rather than at their junctions, thus eliminating any doubt about which section is intended. An effort was made to have all of the excerpts on each tape approximately the same duration while having their points of termination vary widely. This proved to be possible with the sonata-allegro excerpts but not so with the minuets since the overall durations of the latter are very similar.

TABLE 2
POINTS OF TERMINATION AND DURATIONS OF MINUET MOVEMENTS

Excerpt	Duration	Work Excerpted	Formal Point of Termination				
1	0'40"	Wolfgang Amadeus Mozart <u>Eine Kleine Nachtmusik</u>	AA	BAB			
2	1'50"	Franz Joseph Haydn <u>Symphony No. 75 in D+</u>	AA	BABA	CC	DCD	
3	1'04"	Franz Joseph Haydn <u>Symphony No. 54 in C+</u>	AA	BABA	CC		
4	2'40"	Franz Joseph Haydn <u>Symphony No. 87 in A+</u>	AA	BABA	CC	D	
5	2'40"	Franz Joseph Haydn <u>Symphony No. 91 in Eb+</u>	AA	BABA	CC	DC	
6	1'33"	Franz Joseph Haydn <u>Symphony No. 97 in C+</u>	AA	BABA	C		
7	2'55"	Wolfgang Amadeus Mozart <u>Symphony No. 39 in Eb+</u>	AA	BABA	CC	DCDC	
8	2'56"	Franz Joseph Haydn <u>Symphony No. 29 in E+</u>	AA	BABA	CC	DCDC	A
9	2'18"	Franz Joseph Haydn <u>Symphony No. 64 in A+</u>	AA	BABA	CC	DCDC	AB
10	3'12"	Franz Joseph Haydn <u>Symphony No. 102 in Bb+</u>	AA	BABA	CC		

On the answer sheet, an outline of the musical form being heard was provided at the top of the sheet and the five true-false questions near the bottom. The sheets were folded to hide the true-false questions while revealing the formal outline. When the test was administered, before each taped excerpt was played, the appropriate folded answer form was distributed to each subject. The subjects were instructed to listen to the excerpt which they were told would terminate *in medias res*. (They had received ample practice in these procedures during the training sessions.) When the expert terminated, they were told to indicate, on the formal outline, in the midst of which section they believed it to have ended. They were then told to unfold the sheet, answer the true-false questions (guessing

TABLE 3
POINTS OF TERMINATION AND DURATIONS OF SONATA-ALLEGRO
MOVEMENTS

Excerpt	Duration	Work Excerpted	Formal Point of Termination
1	2'00"	Mozart. <u>Symphony No. 39</u> <u>in Eb</u> , 1st movement	1st trans. 2nd
2	1'50"	Mozart. <u>Symphony No. 38</u> <u>in D</u> , 3rd movement	1st trans. 2nd close 1st
3	1'53"	Haydn. <u>Symphony No. 6</u> <u>in D</u> , 1st movement	1st trans. 2nd close 1st trans. 2nd close development
4	2'00"	Beethoven. <u>Symphony No. 1</u> <u>in C</u> , 4th movement	1st trans. 2nd close 1st trans. 2nd
5	2'07"	Mozart. <u>Symphony No. 29</u> <u>in A</u> , 4th movement	1st trans. 2nd close 1st trans. 2nd close
6	2'00"	Mozart. <u>Quartet No. 14</u> <u>in C</u> , 1st movement	1st trans. 2nd close 1st
7	2'07"	Haydn. <u>Symphony No. 8</u> <u>in G</u> , 1st movement	1st trans. 2nd close 1st trans. 2nd close development
8	1'40"	Mozart. <u>Symphony No. 29</u> <u>in A</u> , 1st movement	1st trans. 2nd close
9	2'03"	Mozart. <u>Symphony No. 30</u> <u>in D</u> , 4th movement	1st trans. 2nd close 1st trans. 2nd close development
10	2'06"	Mozart. <u>Symphony No. 30</u> <u>in D</u> , 1st movement	1st trans. 2nd close 1st trans.

where necessary), and sign the sheet. The forms were then collected and the folded forms for the next excerpt distributed. Neither of the post-tests took longer than forty-five minutes to administer.

In devising the true-false questions, only characteristics of the excerpts were employed which were clearly present or absent. The areas most fully dealt with were instrumentation, melodic style and movement, dynamics and formal procedures. Since formal terminology was the principal subject matter of the training sessions, an understanding of it was presupposed and some questions were framed in its terms.

The testing of the hypotheses relevant to this article called for tests of the significance of differences between the following pairs of means:

- Hypothesis 1. The mean scores of the control and experimental groups in estimating the formal points of termination of the excerpts on the post-test.
- Hypothesis 2. The mean scores of the control and experimental groups in answering the true-false questions on the post-tests.

The Findings of the Study and their Interpretation

Findings Related to Hypothesis One—Table 4 presents data related to comparison of the mean performances of the control and exper-

imental groups in estimating the termination points of minuets and sonata-allegro movements. With degrees of freedom of 41 and 39 respectively, in both cases a t -ratio of 2.02 is necessary for significance at the .05 level. In neither case is this level attained and the null hypothesis is not rejected.

TABLE 4
COMPARISON OF MEAN PERFORMANCES ON ESTIMATING TERMINATION POINTS

	N	Mean Scores	Standard Deviations	t-ratio
Phase I: Minuets				
Control Group	21	4.38	2.82	1.44
Experimental Group	22	3.36	1.55	
Phase II: Sonata-Allegro Movements				
Control Group	20	3.30	2.12	.911
Experimental Group	21	2.76	1.47	

It is of particular interest to notice that such differences as do exist between these means—sufficient in the minuets for confidence at the .20 level—are in both cases in favor of the control group. While the level of confidence attained is insufficient to justify more than conjecture, it is tempting to speculate from these data that the experimental method, far from being effective for training subjects to estimate termination points accurately, seems to have led them to perform less effectively than the “mere encouragement” used in the training of the control group.

There are at least three possible interpretations that can be placed upon this finding. Firstly, the training of the experimental group may have made them dependent upon the reinforcement of the response boxes, and deprivation of such feedback during the post-tests may have placed them at a disadvantage. It is possible that had they been permitted the use of the response boxes during the post-tests, they might have performed better. It is also possible that they might have performed better had there been a period during which they were weaned from dependence upon the boxes before the post-tests. If the latter is not so, it speaks ill of the response boxes as a teaching method since dependence upon such extrinsic reinforcement can scarcely be considered a desirable condition for the listener in the concert hall. Secondly, it may well be that keeping track is a self-reinforcing activity and that the use of response boxes is an intrusion upon an otherwise efficient self-reinforcing mechanism. Whether this is so, however, cannot at the present time be known since the notion of self-reinforcement is a purely theoretical construct. Thirdly, it is possible that tracking is one of those situations mentioned by Travers in which information given before responding is more useful than information given after. Certainly the cognitive processes which follow

the receipt of information given after a response are more complicated than storing advance information about the correct response, and subjects taught to rely on the latter may enjoy distinct perceptual advantages.

Findings Related to Hypothesis Two—Table 5 presents data related to comparison of the mean performances of the control and experimental groups in making true-false judgments about briefer aspects of the musical excerpts on the post-tests. With degrees of freedom of 39 and 41 respec-

TABLE 5
COMPARISON OF MEAN PERFORMANCES IN MAKING TRUE-FALSE
JUDGMENTS

	N	Mean Scores	Standard Deviations	t-ratio
Phase I: Minuets				
Control Group	21	30.33	5.91	.621
Experimental Group	22	31.41	5.16	
Phase II: Sonata-Allegro Movements				
Control Group	20	27.85	3.73	.76
Experimental Group	21	28.86	4.31	

tively, a *t*-ratio of 2.02 is again necessary for significance at the .05 level. In neither case is this level attained and the null hypothesis is not rejected. Such mean differences as exist are this time in favor of the experimental group. These differences are very slight, however, and it is quite unlikely that any real difference in ability to notice briefer durations would be found to exist between control and experimental subjects in a larger sample.

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The Education of Canadian Indians: An In-Depth Study of Nine Families

Education, heritage and culture are highly prized by families involved in this in-depth study of Canadian Indians. The study incorporates a number of relatively unique features; these include interviewing without using tape recorders, analyzing the data by means of content analysis procedures, involving the families in organizing the data, and writing the final report in the first person. Findings and conclusions contain implications for education and society. (Dr. Berger is Professor of Elementary Education, Faculty of Education, The University of Alberta.)

In Canada, the national dropout rate of Indian students between grades one and twelve is 94 percent; for non-Indian students, it is approximately 12 percent (Hawthorn, 1966). In the United States (U.S. Congress, 1968):

Dropout rates are twice the national average; the level of formal education is half the national average; achievement levels are far below those of their white counterparts; and the Indian child falls progressively further behind the longer he stays in school.

In citing these and other statistics at the Hearings before the Special Subcommittee on Indian Education, the late U.S. Senator Robert F. Kennedy observed:

These facts are the cold statistics which illuminate a national tragedy and a national disgrace. They demonstrate that the "first American" is in fact the last American in terms of employment, education, a decent income and the chance for a full and rewarding life (*Ibid.* p. 5.).

It is indeed unfortunate for Indians, as well as for the social and economic fabric of two great nations, that greater strides have not been taken to deal with this problem.

What are some reasons for the high dropout rate among Indian children? Can't they learn as well as white children? Don't Indian parents care about education? To find some useful answers, an interdisciplinary, in-depth study involving 40 children and nine families was conducted during the last half of 1971 and the greater portion of 1972.

The two-part study involved children in grades three and four in the Ermineskin School on the Hobbema Reserve. The permission of the reserve's Four Band Council was first obtained. Following a battery of individually-administered tests designed to assess the cognitive strengths of the children, an intervention program was developed on the basis of the test results. This produced significant gains in reading achievement in comparison with a control group of children. The children were using "simultaneous strategies" to solve problems requiring the use of "sequential strategies" (like reading), and *vice versa*; after the intervention program, their test scores increased dramatically.

The part of the study involving the families took place in or near their homes. Five of the families live in the City of Edmonton, one family about five miles west of the city on the Winterburn Reserve, and three about 50 miles south on the Hobbema Reserve. Each family was visited on four occasions. The conversations, which ranged from one to seven hours for each visit, were conducted either in Cree or English.

Before inviting these families to participate, discussions were held with representatives of the Indian Association of Alberta to determine the variables to be considered. The families were then studied with the following variables in mind: whether treaty or non-treaty; Indian or Métis; age of the children; mixed marriage or otherwise; varying levels of income.

The work with the families incorporated a number of relatively unique features. These included interviewing without using tape recorders; analyzing the data by means of content analysis procedures; involving the families in organizing the data; and writing a significant portion of the final report in the first person.

What follows here relates only to the design and rationale, analysis, selected findings and conclusions arising from the work with the nine families.

Design and Rationale

The general design of the study arose naturally from the question:

What are some of the views and feelings of Indian parents in regard to education, culture, and related matters?

In attempting to answer this question, each family was visited on four separate occasions in or near their home. Information was collected during the first three visits and organized during the final visit.

With nearly every family, except where transportation facilities were not readily available the following pattern of visitations was followed:

<i>Visits</i>	<i>Visitors</i>	<i>Language Used</i>
First	Berger	English
Second	Berger and Trippe-de-Roche	English and Cree
Third	Trippe-de-Roche	English and Cree
Fourth	Berger and Trippe-de-Roche	English and Cree

Each visit lasted from one to seven hours. An attempt was made not to interrupt the ongoing lives of the families. On the first visit the families were informed that immediately following the interview, the recol-

lections would be recorded, transcribed, and returned to them, in written form, for them to organize on the final visit. To determine the accuracy of the interviewers' recollections, the following reliability exercise was conducted at the start of the study.

There was a conversation with two Indians not connected with the families. This was recorded. Immediately following this conversation interviewers' recollections of it were recorded onto another tape. Both tapes were then transcribed and the transcriptions were given to three independent observers to assess the quality of the *recollected* conversations against the criterion of the actual conversation as recorded. The results of the assessment made by these independent observers indicated a high reliability for this technique.

The conversations, or "interviews," were conducted in a manner suggested by Lewis Dexter (1970) in his book, *Elite and Specialized Interviewing*, and by Alfred Benjamin (1968) who, in *The Helping Interview*, writes:

I do not see the interviewer as passive in the least. On the contrary, I see him as active at all times. I am not implying that he should talk a great deal, but I am saying that he should make his presence and interest continuously felt. The interviewer is active in gaining as deep an understanding as possible of the interviewee's world. . . . At all times he is active in revealing himself to be a person deeply involved in another person.

A rationale for in-depth studies is provided by David Fox (1969) in *The Research Process in Education*.

There are mass surveys as to the sociopsychological characteristics of children who ultimately become anti-social as to be legally classified as juvenile delinquents. We know that most often they come from broken homes, that, except for sex offenses, they are more likely to be boys than girls, that their social malfunctioning is accompanied, and usually preceded, by academic malfunctioning, and so on. Yet we still have not learned from this mass survey approach how the different deprivations and difficulties interact so that some children become serious delinquents and others, who exhibit the same characteristics identified by the mass survey, do not. The answer lies in other characteristics yet to be identified, and/or in the pattern of interaction of the characteristics in the individual. It is at this level that the case study approach would function, studying the characteristics as they exist in company with each other within the person and life space of individuals.

Further rationale can be found in the preamble to *Let Us Now Praise Famous Men* (Agee and Evans, 1941) and in the Introduction to *La Vida* (Lewis, 1966).

Content Analysis

On the fourth visit each family engaged in a series of intriguing sorting processes to organize the data obtained during the first three visits. The information obtained during the conversations with each family had been previously subjected to content analysis. The typed recollections were scrutinized to cull each meaningful unit of expression (e.g., Harold Cardinal is a great man). Each of these units was typed on a 3 x 5 card; each family had up to 75 cards. On the fourth visit, then, the family placed each of their own cards into categories of their own creation. That is, they looked at a card, said it was "religion" (for example): the

card was then placed in an envelope on which the word “religion” was written. At the end, some envelopes contained many more cards than did other envelopes; some families had many more envelopes, representing categories, than other families.

The families were engaged in a final sorting process. They took the envelopes bearing the categories and made two piles, one containing items of immediate interest and concern, and the other containing items of lesser interest and concern to them.

With the permission of the families involved, the cards that had been made into the fewest number of categories (six) were exchanged with the cards that had been made into the largest number of categories (39). The intent was to see how many categories each family would make with the other family’s data. Family D made 39 categories with their own data and 37 with Family C’s data; Family C made six categories with their own data and 10 categories with Family D’s data. This result was expected,

TABLE 1
TOPICS OF IMMEDIATE INTEREST AND CONCERN TO THE FAMILIES

Common Categories	Families									Totals	
	A	B	C	D	E	F	G	H	I	**	*
Education	**	**	**	*	**		**	**	**	7	1
Heritage and Culture	**	**	**	**	**		**	**	**	8	
Family	*		**	**	**		**		**	5	1
Indian Organizations	**		**	*					*	2	2
Discrimination	*	**	**	*					*	2	3
Integration			**	**	*			*	**	3	2
Employment	**	*		*	*			*	**	2	4
Treaty Rights	**	**		*	*					2	2
Personal Concerns	*			*				**	**	2	2
Language		**					**		**	3	
Religion	*			*	*		**			1	3
Social Status				*				*	**	1	2
History	*			**						1	1
Communication	*						**			1	1

** Indicates "of immediate interest and concern"
* Indicates "of lesser interest and concern"

¹Family F did not continue beyond the first conversation for reasons of a personal nature.
²Extrapolated from cards and categories made by Family I.

the assumption being that the processing of information is not largely affected by whose information is being processed.

The two interviewers scrutinized the typed recollections to see what was actually discussed during the conversational visits. This was for the purpose of determining whether the families chose to discuss certain topics with the Indian visitor and other topics with the white visitor. Two people also (independently) examined all of the cards in all of the envelopes to form common categories.

Selected Findings

The upshot of the organized data appears in the table showing common categories of immediate interest and concern to the families. Of most immediate interest and concern for most families are education, heritage and culture, and family.

Conclusions

As might be expected a great number of surprising insights were achieved as a result of these visits and conversations. Indians, as other people do, express concern with many of the same problems with which we are concerned. Contrary to the stereotype of the Indian being unconcerned about education, the families in this study talked more about this than about any other topic. They saw education as the way to a better life for their children, and desperately wanted them to succeed in school. One family was distressed about their son who had dropped out of school. The only family that indicated "education" to be of "lesser interest and concern" was one where all the children were grown-up and employed.

In conversations with the families and others, it also appeared that Indian people have special problems that directly affect their education. The boy who dropped out of school is illustrative of the many Indian boys who must leave the reserve after grade nine if they want to continue their education. The fact is that most reserve schools do not go beyond grade nine; many do not go beyond grade six. What this means is that these young people must leave their families and go off by themselves, live in a room in the city, and continue their education. It is a trying experience for those who are unprepared for city life. They may be told which buses to take to get to their school, and how to return, but it is often overlooked that it is also vital information for reservation-reared children to know about how to get on and off the bus, or how to transfer to another bus. Some of the families indicated that their children had found a room with old couples who needed the income but who also needed a degree of quiet that few normal teenagers are able to provide. Such problems often arise in regard to the homes in which these youngsters are placed. Often overlooked, also, is the fact that many Indians are very poor, sometimes owning only one pair of clothes. As a result, some children who go to school in cities or smaller communities have to miss school on wash day.

Many Indian people know these problems, but are not in a position to influence changes. This is because they have very little control over their own education. In the Province of Alberta, which provides some of the best education on this continent thanks to the province's wealth

from oil and natural gas resources, it is not legally possible for Indians to sit on Boards of Education. This is information given by a spokesman for the Department of Indian Affairs.

While most reserves have school committees, many are largely ineffective, with Indians having little or no say about who should teach their children. As a result, one Indian family living on the Hobbema Reserve within sight of Ermineskin School sends their children to school in a nearby "white" community because, the husband explained, many of the children cannot understand some of the foreign-born teachers who speak broken English.

If Indians were permitted a little more involvement in their children's education, they would be better able to point out the need for a useful orientation program to help prepare children who must continue their education in the cities. They could also encourage teachers to visit the homes of their school children.

. . . teachers would be welcomed in many homes but the Indian people are shy and so the teachers must make the first move. The teachers should take the initiative in expressing interest in visiting homes. She mentioned one teacher who sent notes home expressing his interest. The children gave the notes to the parents and some of the parents invited him to come and visit with them.

—Family H (Hobbema Reserve)

During a classroom discussion about teachers visiting the homes of school children, one teacher working in a northern Indian community said that teachers there tried to visit the homes but the parents refused them. On further questioning, however, it turned out that a carload of teachers came to visit each of the Indian homes. Most white parents would probably be filled with trepidation at the sight of a group of teachers piling out of a car parked in front of their home, unannounced.

Teachers visiting homes—and administrators giving them time to do so—is a controversial idea. This was made clear to me this summer by an Indian woman who had completed an orientation course for teachers of Indian children. She claimed that students were told *not* to visit the homes of Indians because of the possibility of talking about "politics." The fact remains that the "wrong" parents—in the sense that those who come are relatively well informed—tend to go to parent-teacher meetings. Those who do not come are those who, for their children's sakes, need to be reached most urgently. In trying to reach them, it is helpful to remember that many people feel more comfortable in the familiar surroundings of their own homes rather than within the confines of an imposing school building.

The families were relatively unprejudiced about ethnic differences as between teachers and taught.

I asked her if it is necessary for the teacher of Indian children to be Indian. She felt that the main thing is that the teachers should be good people. The topic of teacher aides came up and she said that it was a good idea to have Indian mothers as teacher aides.

—Family B (Edmonton)

What was striking about Indians along this line is their openness to

share, to accept white people, if only they—the whites—would make the first move.

What happens in most communities is that teachers tend to remain relatively ignorant about the daily lives of the parents and children with whom they are involved. On some reserves, teachers actually cluster together in motel units, with only the braver ones daring to venture out into the culture and the homelife of the people.

The influence of language on thinking and behavior is no secret. As long ago as the 1930s Rudolf Carnap (1937) and B. L. Whorf (1956) studied the influence of language, with the latter observing some of its effects on Hopi Indians. In our study, the effects of language along with other factors were strikingly evident when two families processed each other's data as well as their own. It is very important that fluency and flexibility of language behavior be encouraged.

Mrs. G. said that TV has helped her children; they pick up English and learn about other people as well.

—Family G (Hobbema Reserve)

During the year of the study I learned that I had some stereotypes about Indians—and that some of these stereotypes had been reinforced by Indians themselves! When I went to hear Kahn Tineta Horn (an outspoken Indian woman, who several years back won the title of Princess in the Canadian Annual Indian Princess Pageant) speak at The University of Alberta, she told of her brothers who were high steel workers, and she indicated that Indian children must have an education that is connected with the outdoors. I was startled, in discussing my findings with Indians and other people, how I also had associated Indians with the outdoor life, completely neglecting to take into consideration that *very few people*—Indians or whites—want to be “tied down” to a desk for eight hours a day.

While it may be stereotyped thinking to educate Indians solely for the outdoors, curriculum makers should not overlook the harmonious relationship which Indians tend to enjoy with nature, a relationship which is reflected in much of their talk and writing as well as in their lives. To overlook this relationship is to overlook a vast wealth of resources—to the detriment of Indians and whites alike.

There is much interest now in knowing more about the past and present lives of Indian people.

Mrs. A commented on her schooling and said they prayed fourteen times a day. I thought this was rather remarkable. She indicated that they prayed when they got up. They had mass before breakfast, they prayed after breakfast and on through the day. They also prayed for the Pope and they prayed for the Communists. She mentioned an arithmetic teacher who had come from Toronto who, she said, “was a real fanatic”. Every so often during the day, after they had finished their arithmetic, they would have to get on the floor and say some prayers. She said they also prayed for being sinners. She said she doesn't know how they could possibly have sinned except for the possible sin of everyone thinking they should kill the head nun.

—Family A (Edmonton)

It is good for people to know their own heritage and culture as well as the heritage and culture of others. But the argument is sometimes put forward that, by knowing about one's ancestors and customs, one be-

comes a better person. There may be some truth in this argument. But care must be taken that it does not cloud the fact that people feel good when they accomplish things successfully.

On an airplane trip last summer from New York to Buenos Aires, I sat next to a young man who was born in Italy, grew up in Argentina, then came to New Jersey where, through dint of hard work, he managed to save enough money to open a restaurant; a few years later, at the time of our conversation; he owned a successful restaurant and a house with a swimming pool in New Jersey and a small hotel in Italy. He observed, in broken English, that while he is not able to do many things, there is one thing that he can do better than anyone else in the world—and that is, make the very best pizzas. It seems to me that this is the attitude that must be fostered in schools. Each child must feel, within the realms of his own culture, that he can do something very well. Some may challenge this suggestion on the grounds of a lack of competition among Indians, but what may appear to be a lack of competition is, in reality, politeness on the part of Indians. (It is simply not good manners to show you know answers when others may not know them.) Polite behavior and successful accomplishments can go hand in hand in any culture.

Knowledge of one's own roots is vital, but the fact remains that young people must be able to perform well in school. Knowing one's own culture, while comforting, is not much help to the child who cannot read his books adequately. The books used in most classrooms on this continent are difficult for most children, and the educational problems are aggravated when there are additional potential hurdles like bilingualism and living away from home.

It would be educationally-beneficial for an interdisciplinary team to examine the data derived from this unique in-depth study of nine families and 40 children and then, after interviews with the *children of the families*, develop a meaningful language arts curriculum followed by an in-depth training program for teachers of Indian children.

There are still many questions to be answered; some are vitally relevant to the Indians. One question that still puzzles me is why Indians gave up their language and their religion so readily. True, many now have two marriage ceremonies—one of which is Indian—but most know little about their precious religious heritage, and if I were an Indian I would like to know what happened.

What is also surprising is why Indian leaders have not engaged in a more fruitful public relations program with nearby white communities. In some communities small groups of white children go to school on the reserve nearby, and *vice versa*. But the interaction is very limited. I recall an incident that happened when I drove for the first time alone to the Hobbema Reserve. I stopped at a gasoline station in Wetaskiwin, about ten miles away from Hobbema, filled up, and checked my directions. The teenage white boy was startled: "You're not going to the reserve by yourself, are you?" He told me he had never been to the reserve. That evening, while at the powwow ceremony. I thought of the young man and how much he was missing, even though he lived only ten miles away. In a very real sense *he* was culturally deprived.

There are questions in regard to the psychological impact of the *Indian Act* which have never been properly explored. It is good that Indians receive recompense and reparation for what happened years ago. But what does this inherent paternalism do to the initiative of Indians? Perhaps nothing, but it certainly seems a question worth exploration. For in a very real sense we are all displaced persons. Who among us has not had his roots torn, as if by a shudder of the earth? Who has been able to "hold fast to dreams"? Who has not experienced a sorrow, a loss, and a longing for the past? We are an uprooted people on this planet, and unless we can break the shackles of the past while extracting strength from our heritage we are all of us a lost people hurtling through space.

Acknowledgments

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BOOK REVIEWS

THE PSYCHOLOGY OF THE LEARNING GROUP

By *McLeish, J., Matheson, W., and Park, J.*

London: *Hutchinson University Library*, (1973), pp. 221, (Hardcover £3.00; \$7.50, Paperback £1.50; \$3.75).

This is a welcome addition to the literature on group processes, learning methods and learning experiments. It is of particular interest to anyone concerned with research evidence about teaching methods as it covers a range of investigations carried out at Cambridge and Alberta. It also provides a digest of relevant research reports on learning groups of all kinds—lecture, seminar, “encounter” and others. Essentially this book investigates the claims made by various proponents of small group activity, especially those who support the psychoanalytic, interactionist and behaviourist approaches. The theoretical rationale of these approaches is outlined but the major emphasis of the book is on *outcomes* and *process*, as these are revealed by empirical investigation.

Special aspects of group work are also considered and attention is devoted to evidence relating to teaching qualities which might be relevant to effective work with groups. The final chapter is devoted to a consideration of some reasons why small group learning often fails. The book ends somewhat abruptly at this point.

A full bibliography, a name index and a subject index are supplemented by a glossary. The only critical observations are slight. The glossary details “Conditioning” which is also fully described in the later text. But “T-groups”, for example, are not listed. The asterisk technique enables the first use of a term to be located but this does not mean that its meaning is explained.

The main value of this work is that it sets out to examine research evidence bearing on the actual learnings which take place in groups using the null hypothesis in an area where ideologies, mythology, and ‘a certain kind of religious faith in groups’ abound. The general conclusion is that the original null Hypothesis is not disproved—there is little evidence for the claims made for groups as agents of change. At the same time, evidence is presented that benefits may accrue to those given the opportunity to study the dynamics of the group situation *as observers*.

A.G.J.

PSYCHOLINGUISTICS: AN INTRODUCTION TO RESEARCH AND THEORY

By *Hans Hörmann*

Berlin: *Springer-Verlag*, 1971, pp. xii and 377, \$18.00 (paperback \$12.00)

Certainly one criterion for judging a good book is a reader’s simultaneous feelings of professional humility and scholarly stimulation. On completion of *Psycholinguistics*, a reader is likely to feel distinctly humble for what he doesn’t know about the psychology of language. He is likely to question, more than ever, the notion that language is a behaviour not unlike other behaviours. Concurrently, the wealth of information in this book will be likely to stimulate numerous testable and unanswered

questions. In short, the book represents one of the most provocative volumes yet published in the burgeoning literature on psycholinguistics. While the book specifically focuses on presenting, and placing in context, the methods and findings of psycholinguistics, it should appeal to anyone seriously interested in understanding the psychology of language in general.

The book is derived from a series of lectures at the Free University of Berlin in 1964-65, when the author was Professor of Psychology. The Translation is by H. H. Stern, Professor of Linguistics, at O.I.S.E. Apart from a few awkward Germanisms, and on p. 285, something called a "primary motor", Stern provides a free flowing and readable translation. The book is divided into fifteen chapters, and numerous subsections within each chapter. Throughout this wealth of information, the author never loses sight of his goal: to present an introductory, detailed review and discussion of psycholinguistic thought and research. The reader is left with the feeling that no item is too small and no issue too insignificant to escape the author's attention. The result is a truly catholic survey of the psychology of language.

Hörmann begins by attempting to delineate the field and define the problems faced by a psychology of language. This he finds impossible to do without taking into account certain philosophical points of view. For example, topics such as "language as sign, symbol and expression", and "characterization of the field in which language becomes possible and necessary" are described and critically analyzed; views such as those of "Saussure, Carroll, Bühler, Langer, Pavlov, Bloomfield, Noble, Osgood" are placed in a definite context with their origins traced and contributions seen in light of their origins. In many ways, these introductory chapters are the most impressive in the book. For Hörmann manages not only to bridge the psychological with the philosophical, but firmly to embed the psychological problems in their philosophical *Weltanschauungen*. The reader is left with a real appreciation of the limitations imposed by historical origins and a greater understanding of the implications of point of view.

The central chapters of the book could well be termed a history of modern behaviouristic methodologies applied to language. A tour through information theory, the probability structure of language, verbal associations, and the mechanisms of association constitute these chapters. Hörmann sheds no new light on these matters. These topics have been well mined, particularly in the English-speaking world. Nonetheless, Hörmann's sense of history and scholarly criticisms render them valuable reading.

The next four chapters are devoted to the problem of meaning. The first presents the philosophical background, concentrating on the works of Pierce, Wittgenstein and Morris. This chapter, I expect, will be turning up in numerous readers. It is a masterful description of the works of these innovators of the new era in psycholinguistics. The second gives an account of the Gestalt point of view, where the context determines meaning, and relates these views to those of Deese. A detailed account of the mediation theories of Mowrer and Osgood, and the relative merits of treating meaning as the result of a conditioning procedure constitute the bulk of the third and fourth chapters.

The last four chapters terminate the book on the same level as the introductory chapters began it. A chapter on the imitation of sounds, and

sound symbolisms, reviews the works of Humboldt, Merleau-Ponty, Werner and Brown. Another looks at Chomsky's generative grammar and the possibilities of testing the psychological reality of grammar. A chapter on the development of language and the relationship of language to thought gives a refreshing airing of the views of Mowrer and Vygotsky. The final chapter is on the Whorfian hypothesis and related problems. In developing the themes of these final chapters Hörmann draws on diverse sources. A fortunate byproduct is a kaleidoscope of intriguing topics: a model of bilingualism; semantic satiation; the concept of physiognomy; the concept of recoding; the word as a lure to cognition; colour coding; General Semantics; Lashley's view of the temporal organization of speech events—to name but a few.

I do not want to leave the impression that Hörmann is simply giving us a catalogue. He is not. Each major issue is objectively presented, analyzed in a dialectic manner, and specific and well-documented conclusions are drawn. In fact those who have pet theories may be shocked at some of Hörmann's conclusions: N. J. Johnson has the best model of the psychology of phrase structure rules; Chomskian generative grammar best describes the psychology of generating sentences; Vygotsky has the best model of the relationship of language to thought; Mowrer has the best theory of imitative acquisition. On the other hand, Skinner is given short shrift for his model of language acquisition through delective reinforcement; and Piaget and Werner are seen as vague. Hörmann is certainly not sectarian—in his criticism he covers a wide sampling of schools!

Hörmann's forte is critical analysis. And he hones the dialectic to a fine edge. Unfortunately, this method tends to create an impression that antithetical views are resolved simply because they are so juxtaposed. For example, Hörmann analyzes the Chomsky-Skinner debate with this method. The former is presented as thesis, the latter as antithesis, and the synthesis (a dismissal of Skinner and an integration of Mowrer with Chomsky) could leave the innocent reader with the impression that the issue is resolved; that we are now ready serenely and calmly to advance to a higher level of understanding. That issue is not resolved. Nor do I think it is Hörmann's intention to suggest that it is. He is trying to point out that the relevant issues would be better seen in the light of Chomsky's and Mowrer's views. The fine edge, however, occasionally cuts a wide swath! Fortunately, Hörmann remains in control of his material. On re-reading certain issues, and keeping in mind the overall historical trends and topics of analysis, the specific statements made by Hörmann are neither simplistic nor misleading—they are the outcome of a critical pursuit of new questions to old answers.

Eric Lenneberg (*Contemporary Psychology*, 1968, 13, 502) reviewed the German edition of *Psychologie der Sprache*. He concluded that it would make no sense to translate this book, since more than three-quarters of the work is based on English-language publications. This conclusion makes no sense to me. What an author does with materials is more important than their language of origin. Fortunately, Hörmann and the publisher Springer, did not heed Lenneberg's advice. If they had, the English-language world might have missed an original and refreshingly critical statement on a subject which, especially of late, has been treated like a *sanctum sanctorum* by some of the "true-believer" schools of psychology.

Bruce Bain

CUMULATIVE RECORD: A SELECTION OF PAPERS
(THIRD EDITION)

by B. F. Skinner

New York: Appleton-Century-Crofts, 1972, \$12.95.

This latest edition of *Cumulative Record* includes 48 papers covering a broad spectrum of philosophical, theoretical, educational, therapeutic, methodological, and literary topics. It differs from the second edition through the addition of 18 papers and the removal of two others. The majority of the added papers were actually published in the forties and fifties, and contain some material not previously available in book form. Eight of the 'new lot' are more recent.

Together, the articles provide an excellent summary-picture of the author's work, represented by four decades of rigorous experimentation and debate. A chronological listing of the papers highlights the pre-1960 period of laboratory analysis and the post-1960 period of extrapolation and philosophical argument.

For the experimental scientist (who must constitute the most important segment of Skinner's audience) the more recent articles included in the collection provide nothing new in the way of experimental facts and methods. In place of such scientific information they offer an amalgam of inspirational exhortations, heuristic admonishments, and philosophical speculations.

While Skinner's transition from laboratory scientist to social reformer may be somewhat premature, and even disconcerting to some people, the strength of his position should not go unrecognized. Certainly if one appreciates the breadth and power of the techniques and basic assumptions of Skinnerian experimental analysis, most arguments are consistent and feasible. The author's ability logically to extrapolate from well-documented experiments is unique in its precision.

On the whole, however, this reviewer feels that there is not much in the third edition (with the possible exception of the chapter dealing with the technology of teaching) which really warrants a new publication.

J.F.M.

THE FACE OF EMOTION

By Carroll E. Izard

New York: Appleton-Century-Crofts, 1971, pp. 468, \$14.95.

This book provides a complete and valuable summary of the theories, research studies, philosophical issues, and practical problems associated with man's investigation of his own emotions especially as these are related to facial expressions. In the course of an exhaustive survey, the author formulates his own theoretical position. This posits the existence of a system of discrete emotions operating at four distinct levels—neural, behavioural, expressive, and experiential. The final chapters report a series of cross-cultural and comparative studies stimulated by, and providing empirical evidence for this theoretical viewpoint.

This is a valuable source book for those interested in interpersonal and intercultural communication, or in the assessment and management of behaviour in its emotional aspects.

J.F.M.

INSIDE HIGH SCHOOL

By Philip A. Cusick

New York: Holt, Rinehart and Winston, Inc., 1973, pp. 245, \$4.15.

Making careful use of the field method of inquiry developed by anthropologists (participant observation) the author reveals a vivid and complex picture of the many facets of student life in a centralized district high school. The emphasis of the easily-digested narrative is on the small group associations formed by the students. It is shown how these strongly affect the teachers' classroom behaviour, extra-curricular activities, the actions of the principal and vice-principal, and the behaviour of other students. The report includes a theoretical discussion and draws out practical implications. An appendix on methodological assumptions provides the rationale of the study and also describes various shortcomings.

The book is exceptional both in its objective reporting of data (subjective impressions are always carefully described as such) and in its recognition of the dangers of over-generalization from a single investigation.

J.F.M.

THEORIES OF COUNSELLING

Ed. by B. Steffle and W. H. Grant

New York: McGraw-Hill Book Company, 1972, pp. 326, no price given.

This is intended as an informative textbook for educational counselors. The book discusses the place of counseling theory with special reference to school settings. It delineates four important theories currently in use—client-centered theory, trait-factor theory, psychoanalysis, and behaviourism. Contributing authors are Steffle, Ratigan, Grummon, Williamson, King, Bennington, and Goodstein. The tone of the collection is set in the introduction by W. H. Grant's statement:

"I cannot rely on science to prove that someone has the potential to be self-directed, I must assume that he does."

In place of science the editors propose a kind of esoteric theoretical eclecticism and quasi-religious faith. For them, there is little real difference in saying that man's behaviour is determined or that it is subject to his own free choice. Statements such as: "We may have to act as if we know when, in fact, we know we do not know" are characteristic.

While the individual contributors discuss vastly different philosophical and "scientific" (or unscientific) positions, the general tone is consistently ambiguous and confusing. If the school or educational counselor requires a clarification of his often-times ill-defined role, he must certainly look beyond Steffle and Grant.

J.F.M.

PSYCHOLOGY FOR EFFECTIVE TEACHING (THIRD EDITION)

By George J. Mouly

New York: Holt, Rinehart and Winston, 1973, pp. 560, \$8.35.

This is an introductory text on educational psychology; its format is traditional. The strength of the text lies in the author's intelligent presentation of the basic facts, principles, theories, and viewpoints of psychology as they relate directly to the operation of the classroom and all that this implies. Each chapter contains a list of practical exercises and supplementary readings selected to complement the materials presented. Generally speaking, the information is a paraphrase of, or bears a close

resemblance to, that found in the original sources. Unfortunately, the text is permeated by a pro-American emotional bias—reflected in simplistic notions of “freedom”, “prosperity”, and the goals and virtues of a “democratic” society.

J.F.M.

PSYCHOLOGY OF LEARNING AND TEACHING (THIRD EDITION)

By Harold W. Bernard

New York: McGraw-Hill Book Company, 1972, pp. 500, no price given.

This is an introductory textbook of educational psychology. It consists of seventeen chapters, an appendix, and a glossary. The psychological bases of learning and teaching are highlighted. The nature of these processes, and the effects of classroom transactions and problems are the focus of discussion. The assumption inherent in the materials presented is the author's personal conviction that the optimal promise of continuous learning depends on the teacher's ability to accept his own ego-concept and the ego-concepts of his students.

J.F.M.

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